This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

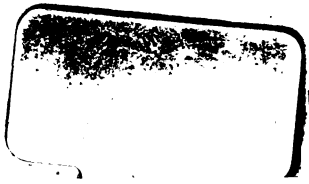
About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

BODLEIAN LIBRARY

The gift of

Miss Emma F. I. Dunston



AUTUMN

REFLECTIONS

ON THE

WORKS OF GOD,

IN THE VARIOUS KINGDOMS OF

NATURE,

AND ON

THE WAYS OF PROVIDENCE,

DISPLAYED IN THE GOVERNMENT OF THE UNIVERSE.

Translated from the German

OF

CHRISTOPHER CHRISTIAN STURM,

Minister of the Church of St. Peter, and Director of the Public School at Hamburg.

BY FREDERIC SHOBERL.

IN FOUR VOLUMES.

VOL. IV.

ALBION PRESS:

PRINTED FOR JAMES CUNDEE,

Ivy-Lane, Paternoster-Row.

1808.

REFLECTIONS

ON THE

WORKS OF GOD,

&c. &c.

OCTOBER 1.

HYMN OF PRAISE TO THE DEITY.

Being an Imitation of the 104*th Psalm.*[*]

ARISE, my soul, on wings seraphic rise!
And praise th' Almighty Sov'reign of the skies;
In whom alone essential glory shines,
Which not the heav'n of heav'ns, nor boundless space confines.
When darkness rul'd with universal sway,
He spoke, and kindled up the blaze of day;
First, fairest offspring of th' omnific word,
Which, like a garment, cloth'd its sovereign lord.
On liquid air he bade the columns rise,
That prop the starry concave of the skies;
Diffus'd the blue expanse from pole to pole,
And spread circumfluent æther round the whole.

[*] It is scarcely necessary to observe that this paraphrase is by Blacklock; and though it is considerably more diffuse than the corresponding article in the original, I am confident that the performance of the blind Scottish bard will not be thought too long by any real lover of poetry. T.

Hymn of praise to the Deity.

Soon as he bids impetuous tempests fly,
To wing his sounding chariot through the sky,
Impetuous tempests the command obey,
Sustain his flight, and sweep the aërial way.
Fraught with his mandates from the realms on high,
Unnumber'd hosts of radiant heralds fly
From orb to orb, with progress unconfin'd,
As lightning swift, resistless as the wind.
In ambient air this pond'rous ball he hung,
And bade its centre rest for ever strong;
Heav'n, air, and sea, with all their storms, in vain
Assault the basis of the firm machine.
At thy almighty voice old ocean raves,
Wakes all his force, and gathers all his waves;
Nature lies mantled in a wat'ry robe,
And shoreless billows revel round the globe:
O'er highest hills the higher surges rise,
Mix with the clouds, and meet the fluid skies.
But when in thunder the rebuke was giv'n,
That shook th' eternal firmament of heav'n,
The grand rebuke the affrighted waves obey,
And in confusion scour their uncouth way;
And, posting rapid to the place decreed,
Wind down the hills, and sweep the humble mead.
Reluctant in their bounds the waves subside;
The bounds, impervious to the lashing tide,
Restrain its rage; whilst, with incessant roar,
It shakes the caverns, and assaults the shore.
By him, from mountains clothed in lucid snow,
Through fertile vales the mazy rivers flow.
Here the wild horse, unconscious of the rein,
That revels boundless o'er the wide champaign,
Imbibes the silver surge, with heat oppress'd,
To cool the fever of his glowing breast.
Here rising boughs, adorn'd with summer's pride,
Project their waving umbrage o'er the tide;
While, gently perching on the leafy spray,
Each feather'd warbler tunes his various lay:
And, while they praise, they sympathize around,
Creation echoes to the grateful sound.
Wide o'er the heav'ns the various bow he bends;
Its tinctures brighten, and its arch extends:

Hymn of praise to the Deity.

At the glad sign, the airy conduits flow,
Soften the hills, and cheer the meads below:
By genial fervor and prolific rain,
Swift vegetation clothes the smiling plain;
Nature, profusely good, with bliss o'erflows,
And still is pregnant, though she still bestows.
Here verdant pastures wide extended lie,
And yield the grazing herd exuberant supply.
Luxuriant waving in the wanton air,
Here golden grain rewards the peasant's care:
Here vines mature with fresh carnation glow,
And heav'n above diffuses heav'n below.
Erect and tall, here mountain cedars rise,
Wave in the starry vault, and emulate the skies.
Here the wing'd crowd that skim the yielding air,
With artful toil their little domes prepare,
Here hatch their tender young, and nurse their rising care.
Up the steep hill ascends the nimble doe,
While timid coneys skim the plains below,
Or in the pendent rock elude the scenting foe.
He bade the silver majesty of night
Revolve her circles, and increase her light;
Assign'd a province to each rolling sphere,
And taught the sun to regulate the year.
At his command, wide Eov'ring o'er the plain,
Primæval Night resumes her gloomy reign;
Then from their dens, impatient of delay,
The savage monsters bend their speedy way,
Howl through the spacious waste, and chase their frighted prey.
Here stalks the shaggy monarch of the wood,
Taught from thy Providence to ask his food!
To thee, O Father, to thy bounteous skies,
He rears his mane, and rolls his glowing eyes:
He roars; the desart trembles wide around,
And repercussive hills repeat the sound.
Now orient gems the eastern skies adorn,
And joyful Nature hails the op'ning morn:
The covers, conscious of approaching day,
Fly to their shelters, and forget their prey.
Laborious man, with moderate slumber blest,
Springs cheerful to his toil from downy rest,

Hymn of praise to the Deity.

Till grateful ev'ning, with her argent train,
Bid labor cease, and ease the weary swain.
Hail! sov'reign goddess! all-productive mind!
On all thy works thyself inscrib'd we find:
How various all, how variously endued,
How great their number, and each part how good!
How perfect, then, must the great parent shine,
Who with one act of energy divine,
Laid the vast plan, and finish'd the design!
Where'er the pleasing search my thoughts pursue,
Unbounded goodness rises to my view;
Nor does our world alone its influence share;
Exhaustless bounty and unwearied care
Extends through all th' infinitude of space,
And circles Nature with a kind embrace.
The azure kingdoms of the deep below,
Thy pow'r, thy wisdom, and thy goodness shew.
Here multitudes of various beings stray,
Crowd the profound, or on the surface play:
Tall navies here their doubtful way explore,
And ev'ry product waft from shore to shore;
Hence meagre want expell'd, and sanguine strife,
For the mild charms of cultivated life;
Hence social union spreads from soul to soul,
And India joins in friendship with the pole.
Here the huge potent of the scaly train
Enormous sails incumbent o'er the main,
An animated isle! and in his way
Dashes to heav'n's blue arch the foamy sea:
When skies and ocean mingle storm and flame,
Portending instant wreck to Nature's frame,
Pleas'd with the scene, he mocks with conscious pride
The volley'd lightning and the surging tide;
And, while the wrathful elements engage,
Foments with horrid sport the tempest's rage.
All these thy watchful Providence supplies;
To thee alone they turn their waiting eyes;
For them thou open'st thy exhaustless store,
Till the capacious wish can grasp no more.
But if one moment thou thy face should'st hide,
Thy glory clouded, or thy smiles denied,
Then widow'd Nature veils her mournful eyes,
And vents her grief in universal cries:

Then gloomy death, with all his meagre train,
Wide o'er the nations spreads his dismal reign;
Sea, earth, and air the boundless ravage mourn,
And all their hosts to native dust return.
But when again thy glory is display'd,
Reviv'd creation lifts her cheerful head;
New rising forms thy potent smiles obey,
And life rekindles at the genial ray;
United thanks replenish'd Nature pays,
And heav'n and earth resound their Maker's praise.
When time shall in eternity be lost,
And hoary Nature languish into dust,
For ever young, thy glory shall remain,
Vast as thy being, endless as thy reign.
Thou from thy regions of eternal day,
View'st all thy works at one immense survey;
Pleas'd thou behold'st the whole propensely tend
To perfect happiness, its glorious end.
If thou to earth but turn thy wrathful eyes,
Her basis trembles, and her offspring dies:
Thou smit'st the hills, and at th' almighty blow,
Their summits kindle, and their inwards glow.
While this immortal spark of heav'nly flame
Distends my breast, and animates my frame,
To thee my ardent praises shall be borne
On the first breeze that wakes the blushing morn;
The latest star shall hear the pleasing sound,
And Nature in full choir shall join around.
When, full of thee, my soul excursive flies
Through earth, air, ocean, or thy regal skies;
From world to world new wonders still I find,
And all the Godhead flashes on my mind;
When, wing'd with whirlwinds, vice shall take its flight
To the deep bosom of eternal night,
To thee my soul shall endless praises pay;
Join, men and angels, join th' exalted lay!

OCTOBER 2.

EFFECTS OF FIRE.

NOTHING in Nature surpasses the power of fire. The effects which it produces on bodies, and the rapidity of the motion of its particles, ought to be contemplated with astonishment. But how few are there that consider these effects worthy of their attention! In our domestic occupations we daily experience the beneficial influence of fire; but perhaps for that very reason we take the less notice of its operations. I therefore think it my duty to remind my readers of this great blessing of Providence, and, if possible, to make them sensible of its value.

One effect of fire familiar to every person, is, that it dilates such bodies as are exposed to its influence. The heaters of box-irons, when new, dilate to such a degree in the fire, that they can scarcely be made to enter; but when they are cooler they may be taken out again with ease. Still more obvious is the expansion of fluids; for instance, of wine, of beer, and particularly of air, by means of fire. Were it not for this property, the thermometer, which acquaints us with the degrees of heat, would be totally useless.

Observe, reader, the effects of fire on inanimate and solid bodies. How soon it transforms some of them into fluids, and converts others into solid substances of a different kind! It communicates fluidity to ice, oil, all fatty substances, and most of the metals. The reason why these bodies undergo this change, is, because their combination is more simple, and their nature more homogeneous than

that of many others. The fire, therefore, penetrates so much the more easily into their interstices, and separates the particles of which they are composed. Hence, also, it happens that such bodies evaporate when the fire penetrates them in great quantity, and with extraordinary force. Some solid bodies undergo other changes. Sand, flint, slate, quartz, and spar are vitrified by fire; clays are converted into a kind of stone; and marble and calcareous stones are changed into lime. The difference of these effects does not proceed from the fire, but from the nature of the substances on which it acts. In one single body it is capable of producing three different kinds of effects; it may melt, vitrify, or reduce it to lime, provided it be composed of three different substances, one of which is metallic, another vitrifiable, and the third calcareous. Thus fire of itself produces nothing new, but developes those particles which before were imperceptible. On fluids fire produces two effects, ebullition and evaporation. The vapors are composed of the minute particles of the fluids, combined with particles of fire or caloric. They are, therefore, specifically lighter than the air, and consequently capable of ascending in it. With respect to living creatures, fire produces in every part of their bodies the sensation of heat, and this element is necessary for the preservation of human life: a certain quantity of caloric being requisite to impart vitality and motion to the blood. To keep up this heat and motion we are every moment inhaling fresh air, which always contains caloric; whereas the air which we expire returns from the lungs exhausted of its vivifying property.

Effects of fire.

All these reflections tend to confirm us in this important truth, that God has arranged all things for the benefit of man, and has endeavored to give him proofs of his love in all his dispensations. By means of fire alone God has conferred innumerable benefits on the earth. By the combination of fire and air the revolutions of the seasons are produced, the humidity of the soil and the health of man are preserved. Water is indebted to fire for its motion; and it would lose its fluidity were all the particles of the latter element separated from it. Fire animates all organic bodies by a gentle motion, and brings them gradually to their perfect growth. It preserves the branch in the bud, the plant in the seed, and the embryo in the egg; it is the means of giving the necessary preparation to our food; it contributes more than any other cause to the formation of metals, and renders them fit for our use. In a word, when we consider all the different effects of fire, we find that by means of this element the Creator has bestowed innumerable blessings on the world: a truth which ought to make the deepest impression on our hearts, which ought to fill them with the highest satisfaction, as well as to call forth our gratitude toward the Author of Nature. The more we investigate the nature of things, the more we discover that they all concur in the wisest ends. We every where perceive the most magnificent plans, the most admirable order, the most perfect harmony between the parts and the whole, between the ends and the means. To attain this conviction, there is no occasion for any uncommon exertion of the mind; the tranquil observation of Nature being sufficient to produce it.

Nothing but the use of our senses is in general necessary to inform us that whatever God has made is wise and good.

OCTOBER 3.

INSTINCTS AND PROPERTIES OF BIRDS.

THE contemplation of the feathered tribes, and of their habits and manners, has often afforded us great delight. Now that a considerable portion of these lively creatures are about to withdraw themselves for some time from our view, we will once more bestow a little attention upon them, and take occasion from them to reflect with lively gratitude and joy on that God who is their Creator as well as ours. To me, at least, it always affords exquisite pleasure to observe the different instincts which the Creator has implanted in every species of birds. None of these instincts is useless or superfluous, but each is indispensably necessary for their preservation or other purposes. Little as we know concerning them, it is, however, sufficient to give us an idea of the wisdom and goodness of God.

When I reflect, in the first place, on that instinct which impels birds to move, I find in this alone just cause of admiration. Experience may convince me that corporeal motions require something more than strength, or sound and flexible limbs. It was not without many attempts and frequent falls that I learned to preserve my balance, to walk, to run, to leap, to sit down, and to rise up again; and yet with a body constructed like mine, these motions seem much

much easier than they are to animals. Birds have only two legs, but their bodies do not rest perpendicularly upon them, projecting both before and behind. Nevertheless, a chicken can stand and run about as soon as it leaves the egg. Young ducks hatched by a hen, know their own element, and swim about upon the water without instructor or guide. Other birds know how to rise immediately from their lofty nests into the air, and there maintain their equilibrium; to advance with equal strokes of their wings, to steer their course with outstretched legs and tail, nay, even to perform voyages of prodigious length to distant regions, without losing themselves.—How astonishing is the art which birds employ to procure a subsistence. Some birds, though not aquatic, live upon fish. They must consequently find it more difficult to seize their prey than water-fowl. What expedient are they taught in this case by the instinct with which Nature has endued them? They stand on the brink of the water, and when the fishes approach in great numbers, which they can see at a considerable distance, they pursue them, skimming along the surface till they perceive a favorable opportunity, suddenly plunge into the water, and bring up a fish. Who has given the birds of prey their piercing sight, their courage, and their weapons, without which they could not possibly subsist? Who teaches the stork in what places to seek frogs and other animals for her food, to traverse the meadows, as well as the ploughed fields in quest of them, and even to continue her search till towards morning, when the other birds begin to be in motion? What surprizing strength must be possessed by the condor, which, we are told, can

carry off a deer, and is not afraid to attack an ox! How can we reconcile with the wildness of the quail, which habit can never entirely overcome, that maternal instinct which causes her to adopt young birds of other species, and to bring them up with the utmost care? With what art the crow conceals the prey which she cannot consume at once, in situations where it is not likely to be discovered by other crows; and when again pressed by hunger, how well she knows how to find the place in which she has deposited her store!

The life of a man would not be sufficient to detail all, or merely the principal facts and observations relative to birds, or to enumerate all the subjects of astonishment and admiration which they present. The few circumstances to which we have adverted will be sufficient to interest a heart that is disposed to contemplate the works of Nature, and to conduct it to more exalted views. Such, reader, is the object which I propose to myself in these reflections. Be not content merely to observe the instincts and the habits of birds; but let this be only the first step to more sublime meditations. Let the admiration excited by the faculties of birds elevate your hearts to that God who has endued the feathered tribes with such astonishing instincts, and who has provided in such a variety of ways for the support and perpetuation of this part of his creatures. Say not that Nature hath taught them all these arts. Nature, considered separately from her author, is a word without a meaning. Let us, on the contrary, glorify our Creator by acknowledging that it is he who hath formed the birds with such exquisite wisdom.

OCTOBER 4.

RE-PRODUCTION OF ANIMALS.

HERE a new field of wonders, that seem directly to contradict the principles adopted with respect to the formation of organic bodies, is opened to our view. It was long thought that animals could not multiply, except by means of eggs or living young: but it now appears that the general rule is subject to many limitations and exceptions, since it has been found that certain animal bodies may be divided into as many complete bodies as you please; each part thus separated from the parent animal soon recovering whatever is deficient. It is no longer doubtful that the polypus is an animal, notwithstanding its resemblance to plants in its form and manner of propagation. The bodies of these creatures may be cut across or longitudinally, into ever so many pieces, and each piece becomes a complete polypus. Even the skin and the smallest portions will produce one or more polypi; and if the pieces thus cut off be placed in contact, they unite in the most perfect manner, mutually contribute to the support of each other, and become one body. This discovery led to many other experiments, which have demonstrated that there are other animals whose bodies may be divided without ceasing to live and grow. The earth-worm multiplies by cutting. The tail part in time receives the accession of a head, and the two pieces become two distinct worms. When they are once divided they never grow together again. They remain in the same state in which they are separated, except perhaps, that they lose more or less

in bulk; but after some time, a small white button begins to appear, and gradually increases in length and breadth. You soon afterwards perceive rings, which are at first very close to each other, but which by degrees expand and grow larger. New lungs, a new heart, a new stomach, and with them many other organs are formed. With snails we may at any time make the following experiment. Cut off the head not far below the two large horns, and after some time the head will be replaced by another. A similar circumstance is observed with respect to crabs. Break off one of their claws, put them again into the water, and in a short time you will observe that the limb is re-produced. A very remarkable experiment was made by Duhamel on the thigh of a chicken which had been broken. After the fracture was healed, and a schirrus completely formed, he cut away all the rest of the flesh from the bone. All the parts grew again by degrees, and the circulation of the blood was renewed.

Thus it is certain that there are animals which may be multiplied by dividing them into pieces; and we no longer doubt the existence of animals whose young are produced like the branches of vegetables; which, when cut in pieces, are renewed even in the smallest of these parts; which may be turned inside out like a glove, divided, and then turned again without ceasing to live, eat, grow, and multiply. Here arises a question, which, perhaps, no naturalist can resolve in a satisfactory manner: How happens it that the parts thus cut off form perfect animals? It is to be presumed that germs are diffused throughout the whole substance of these bodies, whereas in others they re-

side only in certain parts. These germs are developed of themselves when they receive the necessary nourishment. Thus the separation of the different parts of the body merely diverts the juices which would have been conveyed through other channels, and conducts them to the germs. This superabundance of nutritious juices unfolds those parts which would otherwise have remained involved in each other. Every part separated from the polypus, or the worm, contains, like the bud of the vegetable, all the viscera necessary for independent existence. The parts essential to life are distributed over the whole body, and the circulation is carried on in the smallest particles as in the whole animal.

It is, nevertheless, impossible to comprehend all the means which the author of Nature has adopted to impart life and sensation to such an astonishing multitude and variety of creatures. We cannot, therefore, maintain that the animals we have mentioned are the only exceptions to the general rule in their mode of propagation. The fecundity of Nature, or rather, the boundless wisdom of our Creator surpasses in every particular our feeble comprehensions. The hand which formed the polypus and the worm has shewn us how easily it can impart to matter the animal structure and organization. In others of its works it has simplified these still more, and, descending by insensible degrees, it has at length arrived at the extreme limits of animated nature: but where these limits are to be found, is yet a mystery to man. O my brethren, let us, with a humble sense of our ignorance, silently admire and adore the infinite intelligence of our Creator! No where is his greatness more glo-

riously displayed than there where we cannot discover any traces of it.

The re-production of animals reminds me of that great change which shall take place on the day of resurrection. What we here behold on a small scale will then be manifested on a large scale. What we here observe in other bodies, we shall then experience in our own bodies. The smallest particles shall produce bodies destined for the enjoyment of everlasting felicity.

OCTOBER 5.

OF THE ORGANS OF TASTE.

Our pleasures would be considerably diminished if we had not the faculty of distinguishing by the taste the different kinds of food which we use. I am naturally led to the consideration of this subject by the different kinds of fruit which this season affords us. We should likewise lose much of the pleasure which our palate receives from fruit, if the apple, the pear, the plum, the grape had all the same taste. The variety of flavor is therefore a wise and bountiful dispensation of Providence, which is well worthy of reflection, and calls for our gratitude towards our gracious Creator.

But how happens it that I can immediately distinguish by the taste the different kinds of food which I make use of? My tongue is the principal organ of taste. To this end its surface is covered with nervous papillæ, by means of which we receive the impression of taste. This sense, therefore, depends upon the nerves, as is evident on dissecting the tongue. When the membrane which

covers it is removed, we discover a great number of roots, in which the nerves terminate. The sense of taste is confined to the part covered by these nervous papillæ, and where they are wanting, that sense also is deficient. When we put highly-flavored things under the tongue, we have no perception of them till they are dissolved or attenuated; and it is not before they come to the sides and surface of the tongue that we are sensible of their flavor.

The papillæ are of several sorts. The first kind are few in number, and are placed in the back part of the tongue. Their form is nearly that of an inverted cone; they are not of a very delicate structure, nor are they much concerned in tasting. The second kind, which are smaller and softer than the preceding, and into which the first gradually degenerate, have somewhat of the form of a mushroom; they are scattered on the superior surface of the tongue, till, becoming more numerous towards its sides, they are distributed in diverging lines. The third kind, of a conical form, are mixed with the other kinds, and are very generally distributed over the whole superior part and sides of the tongue. They are endued with a very acute power of sensation, and are the true organs of taste. These conical papillæ differ greatly in size, and some of them are extremely minute. On an accurate examination, we also find some filiform papillæ placed in the interstices of the conical.

Here, reader, I wish you to pause a few moments, and reflect. What skill is displayed in the structure of this organ of taste, though no anatomist has yet discovered all the individual parts of this machine! Is it not the effect of infinite wisdom that the tongue is furnished with a greater

abundance of nerves and fibres than any other member, and that it is full of little pores, that all the saline and savory parts of food may penetrate more deeply, and in greater quantity to the avenues of taste? Is it not from an arrangement of the same wisdom, that the same nerves, whose fibres spread over the palate, tongue, and throat, send out branches to the nose and eyes, like messengers, to apprize the organs of the other senses to contribute their share to the better distinction of food? The duration of the organ of taste is likewise worthy of notice. Delicate as is its structure, it lasts longer than instruments of stone or steel. Our garments wear out, our flesh becomes shrivelled, and our bones dry; but the sense of taste still remains, unless we wantonly destroy it. How admirable are the ends of divine wisdom displayed, only in the structure of this single sense! O man, thou art the only animal which is conscious that it is endued with senses, the only one that is capable of deducing, from the contemplation and use of the senses, the existence of a God. Endeavor, then, with the divine grace, to make a good use of this faculty. If thou wilt not acknowledge the wisdom and goodness of thy Creator, who else is to render him that homage? You enjoy the sense of taste in higher perfection than any other creature. The animals have but few aliments for which they manifest a preference: but reflect on the superabundance of alimentary substances which the Creator hath prepared for you. The animal, the vegetable, and even the mineral kingdom, are all tributary to your support, and furnish you with different kinds of food, which afford the most varied gratification to the taste. The heavens and the earth,

the air and the seas contribute to our happiness; and which way soever we turn our eyes, every spot teems with the blessings of the Most High. The animal and the vegetable creation, the depths of the vallies and the summits of the mountains, the recesses of the forests and the bosom of the deep, plentifully supply us with necessaries and with pleasures.

It is but just, therefore, that we should highly value this gift of our Creator; but let us not prize it beyond what the purpose for which it was bestowed requires. Taste is but a mean of attaining more important ends; but it is not the object of our existence. It would, therefore, be absurd, if we placed our principal happiness in the gratification of this sense, and made eating and drinking the chief business of our lives. No, my brethren, let us not by such conduct degrade ourselves to the level of the brute, whose highest pleasures are those of taste; but, on the other hand, let us reflect, that we have an immortal soul, which cannot be satisfied with any thing short of everlasting goods; and to have a relish for these, and to be desirous of being nourished by them, constitutes the wisdom and felicity of the man and the Christian.

OCTOBER 6.

OF THE GOVERNMENT OF GOD WITH RESPECT TO NATURAL EVENTS.

EVERY circumstance that takes place in the heavens or the earth, in the sea and in the air, is regulated by laws which Nature has prescribed. At the same time it would be absurd to deny the influ-

ence of a particular Providence which governs natural events, and employs them as its instrument in the completion of its designs. God makes use of natural causes to reward or to chastise mankind; at his command the air, for instance, is pure or infectious, and the seasons are fruitful or barren. He checks or favors the enterprizes of men, sometimes by winds and tempests, at others by the ebb or flood. God, it is true, very rarely interrupts the regular course of Nature; but it is equally certain that Nature cannot act without his aid and concurrence. The parts of which the visible world is composed have not the power to employ their energies as they please; but God can influence his creatures as he thinks fit, without overturning the order of Nature. Fire, water, wind, and rain have their natural causes and energies, yet God makes use of them to accomplish his designs in a manner suitable to their nature. He employs the heat of the sun to warm and fertilize the earth, and sends rain and wind to purify and cool the air: but he retains the power of regulating the measure and manner in which they shall be distributed.

A great part of the good and evil that we experience in life proceeds from the objects with which we are surrounded. As God takes an interest in every thing that happens to man, he must consequently possess the power of influencing all Nature. Hence spring the rewards which he promises to virtue, and the punishments with which he threatens vice. The one he crowns with peace and plenty; and, when he pleases, sends famine and pestilence to chastise the other. In a word, all natural causes are immediately subject to the divine providence. Men themselves may serve for examples of the

government of God. In how many instances do we observe human art triumph over Nature! It cannot, indeed, alter the nature of things, but it knows how to make use of natural causes, so as to produce effects which would not have taken place without the intervention of the hand of man. If, then, the Most High has submitted natural causes to human art, how much more rational is it to suppose that he has reserved for himself the supreme direction and government of all these things!

From all this we may conclude how absolutely necessary it is that a particular Providence should preside over the government of the world. Natural causes are, doubtless, excellent instruments; but to be useful to us they require the direction of a wise governor. This may be inferred from the various changes of the weather alone. These changes demonstrate that Nature is not governed by movements resulting only from art; for this kind of alteration is permanent and uniform. Hence we may learn what we ought to ascribe to God, and what we have to expect from the ordinary course of Nature. It would be unreasonable to desire that God should every instant change the laws of Nature which he has once established; that, for instance, if we fell into the water or into the fire, we should not be drowned in the one, or burned in the other. Thus also, divine Providence is not obliged to preserve our lives when we shorten them by intemperance; for God cannot be expected to perform miracles to save men from the calamities in which they involve themselves by their own folly and misconduct. For the rest we are warranted in attributing to the bountiful providence of our God, all those particular and gracious dispensations which

minister to our wants, and fill our hearts with joy. All the disorders of Nature may be regarded as the effects of the divine indignation, and as the means which the Almighty employs to punish the sins of mankind. On this truth are founded, on the one hand, our prayers, in which we implore God to grant us prosperity, peace, and fruitful seasons; and likewise our thanksgivings, expressive of our gratitude for the mercies we have received.

OCTOBER 7.

INEXHAUSTIBLE RICHES OF NATURE.

NATURE is so liberal towards her creatures, so abundant in supplying all their wants and all their pleasures, and so rich in her gifts, that the drops of ocean are perhaps not equivalent in number to the blessings which God has dispensed in Nature.

How much does one man only require, during a life of sixty years! How much doth he want for food and raiment: for the necessities and the conveniencies of life; for the pleasures, amusements, and duties of society, and finally, for extraordinary cases and unforeseen accidents. Every individual, of every rank and condition, from the monarch to the beggar; of every age, from the infant at the breast to the hoary-headed old man, has his particular wants in every region of the globe, according to the peculiar modes of life of the inhabitants; each not only requires a different kind of aliment, but must have his own separate and distinct supply of food: and yet we observe that Nature provides with such liberal hand for all, that they are always able to procure whatever is neces-

sary for their subsistence. Ever since the creation of the world, the earth has not ceased to open her bosom; the mines are not exhausted; the sea affords a never-failing supply for the necessities of a great number of creatures; the plants and trees still produce seeds and shoots, which yield their fruit in due season. Bounteous Nature diversifies her riches, that they may not be exhausted in one place: and when one kind of vegetables, of fruits, or of provisions begins to diminish, she produces others, and directs the taste of man to those which are most abundant.

Nature is a frugal housewife, who takes care that nothing shall be lost. She finds a use for every thing. The insects serve as food for larger animals, and these are always useful to man in one way or another. If they do not supply him with food, they at least provide him with raiment; and if they are fit for neither, they furnish him with arms and weapons of defence; but if they answer none of these purposes, they afford him medicines. If disease sweeps off certain species of animals, Nature soon repairs the loss by the multiplication of others. She even converts the dust and putrid substances into nourishment for certain species of minute animals, or into manure for her own soil.

How rich is Nature in her beauties and her charms! Her most enchanting attire requires nothing but light and colors, with which she is abundantly provided; and the spectacle she presents is continually varying, according to the point of view in which it is beheld. Here the eye is struck with the most exquisite beauty, there the ear is delighted by the greatest variety of melodious sounds, and the smell is regaled by the most agreeable perfumes.

Art steps in, and forms a thousand new productions. The blessings of Nature are of such a kind, that though all men were to make use of one of them a hundred times, still it would afford each undiminished gratification. With what wisdom hath she distributed her gifts over the whole earth! She takes from one, and gives to another; and, by means of men, establishes such relations between distant countries, that her gifts are enhanced in value by their continual circulation. She compounds her benefits, as the apothecary mixes the ingredients of the medicines. She takes of the small and the great, the fair and the unseemly, the old and the new, and skilfully combines them into a whole, equally useful and agreeable. Such are the inexhaustible riches of Nature in the hands of God.

And who am I, that I should daily enjoy my portion of the riches of Nature! How often hath Nature opened her liberal hand for me, and poured forth also upon me her horn of plenty! And, what is infinitely more important, what riches of divine grace have been conferred on me! Nature is rich, but the stores of grace are much more copious. The one supplies only my corporeal wants; the other provides for the indigence and nakedness of my soul. The former affords me manifold pleasures, but which must some time have an end; the latter bestows delights which shall last for ever. The one regales my senses; the other fills my whole soul with transport. O! may I learn to be thoroughly sensible of the infinite goodness of my God! May all the benefits which he confers on me in the kingdom of Nature and of grace, enkindle my love to God, and encourage me to place more and more

confidence in him! And shall I not glorify so gracious a God? Shall I not acknowledge his beneficence? Shall I turn a deaf ear when he calls me; and refuse to walk in the path which he points out? Ah, no; be it, on the contrary, my most pleasing duty to call to mind the wonders of his love! Forget not the Lord, O my soul, for never hath his goodness been unmindful of thee!

OCTOBER 8.

PETRIFACTIONS.

THE translation of animals and plants into the mineral kingdom, is a natural phenomenon which is worthy of our attention. Petrifactions are actually a species of medals; the examination and explanation of which may tend to throw considerable light on the natural history of the earth.

The first thing to be considered in petrifactions is their external form, which clearly demonstrates that they once belonged to the animal and vegetable kingdom. Men are seldom found in a state of petrifaction; neither are fossil remains of quadrupeds often met with. Most of the extraordinary skeletons discovered in the earth, are those of elephants, which have been dug up in different parts of Germany. Petrifactions of aquatic animals are much more common. Entire fishes are sometimes found, and so perfect that the smallest scales may be discerned. The number of all these, however, is not to be compared to that of petrified snails and worms that are found buried in the earth. Their multitude is not only prodigious, but they are of so many different species, that living animals of all the

classes have not yet been discovered. Marine petrifactions are met with in astonishing quantity, in different situations, in every region of the globe. They are sometimes found on the summits of lofty mountains, many thousand feet above the level of the sea. They are likewise discovered at a greater or less depth in the earth. The various strata of which the earth is composed likewise contain all kinds of petrified plants, and their parts; though sometimes nothing but the impression of them is to be found. In many places we meet with great numbers of trees, buried more or less deep in the earth; but these petrifactions do not appear to be of great antiquity.

But how have all these petrified substances become buried in the earth? How happens it that such bodies are found on lofty mountains? How have animals, whose native element is water, and which are strangers in our climates, been transported to those situations?—Many causes may be assigned for this phenomenon. Perhaps these petrifactions are a proof that the greatest part, if not the whole of the habitable earth, was once inundated by water. The marine productions found in every explored situation of the globe, from the summits of the highest mountains to the bottoms of the deepest mines, can scarcely be ascribed to any other cause. The great quantity of petrified shell-fish often observed in very high situations, and commonly lying in regular strata, afford reason to believe that these eminences once formed the bottom of the sea; and this is the more probable, as we know that the bed of the ocean resembles the surface of the land. Respecting the way and manner in which Nature effects these petrifactions, we have

yet a very imperfect knowledge. In the air dead animals become putrid, and decay. The air must therefore be excluded from places in which the process of petrifaction is carried on; or, at least, its operation must be suspended. A dry soil possesses no petrifying property; and running waters may encrust some bodies, but can scarcely transform into stone the interior of substances exposed to their current. It therefore appears highly probable, that a certain humidity, accompanied with dissolved particles of stony substances, is necessary for petrifaction. This mineral fluid penetrates into the smallest pores and cavities of the vegetable and animal substances, and as the natural particles of those bodies decay, the foreign matter combines in its place, and this process is continued till the total transformation is accomplished. From this account we may deduce certain consequences, which tend greatly to elucidate this phenomenon of Nature. Neither every animal nor every plant is equally adapted to undergo petrifaction; for that purpose bodies should have a certain degree of solidity, that may prevent putrefaction till they become petrified. Petrifactions are commonly formed in the bosom of the earth, and require a situation where the body to be transformed may neither be too dry, nor be dissolved by too much humidity. All the different kinds of stone which contain petrifactions, or form the substance of them, are the work of time, and consequently they are daily producing. Such are calcareous stones, grits, the loadstone, and others of that class. The same difference that subsists between the stony matters by which bodies have been petrified, is likewise found in the petrifactions them-

selves; they are sometimes calcareous, at others argillaceous, and at others again silicious.

Were petrifactions of no other use than to throw a light on the natural history of our globe, they would on that account alone be highly deserving of our attention: but we may likewise consider them as proofs of the manifold operations and transformations in which Nature is secretly engaged; and herein is manifested another admirable dispensation of the power and wisdom of God.

OCTOBER 9.

OF THE GRADATIONS IN NATURE.

WE may observe throughout Nature an admirable series of gradations, or an insensible progress from the simplest to the most complex perfection. Thus there is no intermediate species but what has a peculiar character distinct from that which precedes, and that which follows it; so that neither a void nor a break is to be found in all Nature.

Dust and earth are the principal substances in the composition of all solid bodies. They are found in all bodies that are decomposed by art. From the combination of earth with salts, oils, sulphurs, and other substances, result different kinds of earths, more or less compound, porous, or solid. The latter imperceptibly conduct us into the mineral kingdom. The species of stones are very numerous, and their figure, color, size, and hardness are also extremely different. They contain all kinds of metallic and saline particles. From these are formed the minerals and precious stones. Among the last class of stones we find some that have fibres,

laminæ, and leaves, as slate, talc, and lithophytes, or stony marine plants, and the stony flowers of mines, and these lead us from the mineral into the vegetable kingdom. The plant that seems to hold the lowest place in the scale of vegetation is the truffle, after which come the various species of fungi, mushrooms, sponges, and mosses. All these imperfect plants only form, as it were, the limits of the vegetable kingdom. The more perfect plants are divided into three great families, which are distributed over the whole surface of the earth. These are herbs, shrubs, and trees. The polypus seems to be the connecting link between the animal and the vegetable kingdom. From its appearance we should take this singular production for a plant, did it not perform regular animal functions. The worms commence the animal kingdom, and lead us to insects. Those worms whose bodies are inclosed in a scaly or stony shell, seem to unite the insects and the shell-fish. Between these, or rather by the side of them, is a class of reptiles, from which the water-snake forms the transition to the fishes. The flying-fish leads us to the family of birds. The ostrich, whose legs resemble those of a goat, and which rather runs than flies, seems to link the birds with the quadrupeds. The ape appears to be the intermediate species between quadrupeds and man. Human nature, like every thing else in the world, has its gradations. How many intermediate links are there between the ape and the most perfect man, and how many others between man and the angels! How many glorious ranks between the archangel and the Creator of all things! Here, new gradations, new designs, new beauties, and new energies are disclosed. But an impenetrable veil con-

ceals all these gradations of a future world from our view. So much, however, I know, to my comfort, from the testimony of revelation, that the great space between the cherub and Godhead, is filled by Jesus, the incarnate God. Through him I am exalted to the highest rank among created beings; through him I am permitted to approach the throne of the Eternal.

Survey, reader, all these gradations in Nature. This brief sketch may serve to shew you, that every thing in the universe is closely linked and connected with the grand chain. There is nothing in it but what is the immediate effect of some previous cause, or which does not determine the existence of something that is to follow. Nature does not proceed by leaps: every thing advances gradually from the constituent part to the body composed, from the imperfect to the perfect, from what is near to what is more remote, from inanimate things to animated objects, from corporeal to mental excellence. But how limited is our knowledge of this prodigious chain of Nature! We can discover only a few ill-connected, interrupted, and transposed links. Defective, however, as our intelligence may be in this respect, it is sufficient to give us the most exalted conceptions of those exquisite gradations, and of the diversity of beings which compose the universe. All these lead us up to thee, O Eternal, though from us to thee the distance surpasses all comprehension. Thou art the only Being not included in the chain of Nature. From the grain of sand to the seraph, all things are indebted to thee for their existence and their perfection. Often will I ascend in spirit by the ladder of thy creatures: from the dust on which I tread, and of

which I am composed, I will soar aloft on the wings of devotion to thee, O Being uncreated, eternal, and incomprehensible! Then shall my soul aspire to be soon admitted into the assembly of those spirits, where I shall learn to know God and his works, even as I am known. As long as I live here below, I advance to perfection but by degrees. I gradually pass from ignorance to superior intelligence, from corporeal to spiritual, from infirmities to virtues. This present life is but the commencement, the dawn of my existence; my soul prepares for more glorious days, and murmurs not against him who formed me out of dust. I know that his love is extended to the dust which he has fashioned, and that he has destined me for ineffable felicity.

OCTOBER 10.

FALL OF THE LEAVES.

We now begin to perceive the gradual ravages made by the approach of winter in the gardens and forests. All the plants, with the exception of very few, lose their principal ornaments, their leaves. What is the cause of this change? The most evident is the autumnal frost; for scarcely have the leaves been covered by the first hoar-frost, but they begin to fall in heaps, and the whole vegetable kingdom is soon stripped of its foliage. It is impossible to be otherwise; since the cold checks the circulation of the sap in plants, and prevents their perspiration through the leaves. But cold is not the only reason why plants lose their foliage. The same change takes place in mild winters, when

there is no frost; and is also experienced by those vegetables which we seek to preserve in green-houses from the effects of the cold. It is, therefore, probable that other causes must contribute to strip the trees of their leaves. May not the decay of the leaves proceed from this, that the roots no longer supply them with the necessary quantity of sap for perspiration? For it cannot be denied that the branches continue to encrease in thickness a considerable time after they have ceased to grow in length. If, therefore, at the time when the branches still continue to grow in thickness, the stalks of the leaves do not increase in size, their fibres must consequently be detached from the fibres of the branches, and the leaves then fall off.

But perhaps it may be asserted that the falling of the leaves is one of those things which might have been dispensed with, and which are totally useless to the world. Such an idea is contradicted both by reason and experience. Nothing in Nature is entirely useless, nothing perishes. Thus the foliage which falls from plants and trees is productive of considerable benefit. The leaves rot upon the ground, and serve it for a manure. The rain and snow dissolve the saline particles which they contain, and convey them to the roots of the trees. The multitude of leaves strewed upon the ground protects the young plants from the cold, and affords seeds the requisite warmth and humidity. These observations particularly apply to oak leaves. They serve to manure and fertilize the old trees, as well as to protect the young shoots, and are also beneficial to the pasturage in the woods, by promoting the growth of the grass upon which they fall and decay. These advantages are so important, that

the fallen leaves are never collected for the purpose of making manure, unless they lie in such abundance as rather to choak the grass than to encourage its growth.

Leaves are used for manure in various ways. They may be spread in stables and cow-houses instead of straw, or they may be mixed with other kinds of manure. The mould they produce is particularly useful in gardens, for hot-beds. It likewise contributes greatly to the growth of fruits and of young trees.

But, some one may perhaps object, how many insects that dwelt on the leaves of trees and plants must perish by their fall. It is true that autumn hurls to the ground whole hosts of insects, with their progeny; but does it thence follow that these little creatures perish? What prevents them from continuing to live upon the earth, enveloped in the leaves, which are their best protection from the cold?

The fall of the leaves is an emblem of human life, and of the frailty of all terrestrial things. I am a falling leaf; death walks by my side: to-day, perhaps, I shall wither, and to-morrow be converted into dust.

How soon may I be stripped of all my beauty and all my vigor! A cool breeze may hurl me to the ground, and my mortal remains shall then return to dust. If I but leave behind me good fruits, fruits that have arrived at maturity, I shall then be able to quit the world with honor and with joy.

OCTOBER 11.

OF THE DIFFERENT SPECIES OF EARTH.

OUR knowledge of the interior conformation of the earth is chiefly conjectural. Notwithstanding the great depth to which some mines have been carried, yet the deepest shaft does not exceed nine hundred feet, or about the sixth part of a mile. Were men to attempt to penetrate farther, the great pressure of the air would prove fatal to them, if it were even possible to prevent the access of water which is commonly met with in great quantity at that depth. And what is the sixth part of a mile in comparison of the semi-diameter of the globe, comprehending more than three thousand five hundred miles! Much the greater portion of the interior of the earth must consequently remain for ever unknown to us: for scarcely the exterior incrustation has been penetrated by miners. So much, however, we know, that when they have dug to the depth of several hundred feet, they have found this incrustation composed of various strata, lying one above another. These strata are more or less numerous, and differ in thickness and order in different places. Under the common mould are generally found clay and loam, but sometimes strata of sand and marle intervene. The divisions of the different species of earth may therefore be extended or abridged at pleasure; but on comparing them together, it appears that they may be conveniently divided into seven classes.

The black earth, or mould, composed of decayed animal and vegetable substances, contains a large proportion of saline and combustible matters.

Dung is, in fact, of the very same nature as this earth. Clay is more compact than the black earth, and retains water for a longer time upon its surface. Sandy earth is hard, light, and dry; it neither retains water, nor is dissolved in it. Though the poorest of all earths, certain species of vegetables will nevertheless grow in it. Marle approaches nearest to the preceding, but it is more friable, consequently not so hard, and more readily attracts humidity. Peat-earth contains a vitriolic salt, that is much too acrid for plants. Calcareous earth is very dry, hard, and brittle; but yet certain vegetables thrive in it. Lastly, stones themselves produce plants. Do we not find the barest stones, without one particle of mould, covered with mosses, which belong to the vegetable kingdom? And who is there but what has observed birch-trees springing forth from the clefts of the rocks, and growing to a considerable size?

These different kinds of earth, of which the strata of the globe are composed, have been arranged with great wisdom and goodness by the Creator. For, to mention only the principal advantages we derive for them, these subterraneous layers of sand, gravel, and light earth favor the passage of fresh water, which filtres through them, is purified in its progress, and at the same time distributed through every part of the earth. These are also the reservoirs of springs, and the principal channels of fresh water. It is worthy of remark, that these channels are found over the whole surface of the earth in every country, and that they are chiefly composed of light earth. Though it may sometimes be mixed with a soil that is harder and more stony, this only serves the better to purify and refine the water.

This diversity of soils is likewise extremely beneficial to the vegetable kingdom; for to this cause it is owing that certain herbs, plants, and trees grow spontaneously in some countries, while in others they are not produced without the assistance of art. All that art can do in this case is to imitate Nature, who has prepared for each plant in its wild state, the soil, air, nourishment, and temperature most favorable to its vegetation. This same variety of soils is also the reason that certain situations produce grass, herbs, and trees, whose internal structure differs in some respect from that of other vegetables of the same species. We find accordingly that some plants thrive in the soil where others languish; that one has a taste totally different from another; that some vegetable productions will not grow at all in certain soils; that such as have at first small, weak, and fibrous roots, and little sap, ought to be sown and planted in a very light, sandy soil, that the roots may spread without much obstruction, that the rain may easily penetrate, and that the earth may not contain too many saline, acid, and oleaginous particles. Are we not told that lettuce, sallads, and other vegetables may be produced fit for table in the space of forty-eight hours, if the seeds are previously steeped in *aqua vitæ*, and the earth in which they are to be sown is mixed with pigeon's dung, and powder of slaked lime? Whether this be possible or not, a certain preparation of the soil is certainly indispensably necessary for vegetation.

From the preceding observations you may discover, my dear reader, with what wisdom God has provided in the formation of the globe, for the production of vegetables and the welfare of his crea-

tures. It is, therefore, extremely wrong to complain of the sterility of particular soils; for the Creator, in his wisdom and goodness, has always taken care that the countries which he has assigned to man for his abode should always afford him whatever is necessary for his subsistence. And though many tracts may appear less fertile than others, the great Author of Nature has certainly compensated this loss by other important advantages, or has endued the inhabitants with a more industrious disposition.

OCTOBER 12.

OF WINE.

IT is just, reader, that you should admire with me the widely-extended beneficence of our Creator, when you reflect on the manifold advantages we derive from wine. He would have conferred on us an especial mark of his favor, had he only given us abundance of bread and other aliments for our support. He has done still more: he has graciously provided also for our pleasure and refreshment. To render life truly comfortable, and to promote our health, he created the vine.

No other beverage, whether natural or prepared by art, produces effects equal to those of wine. Wine alone is capable of dispelling melancholy, and exciting pleasurable sensations, which are equally beneficial and equally necessary for the soul and body. Its generous spirit immediately recruits the strength exhausted by fatigue. Bread enables a man to work, but wine causes him to perform his labor with pleasure. Ardent spirits, and

liquors produced by art, cannot communicate to the countenance that unaffected air of cheerfulness which wine imparts. And here, reader, pause and reflect on that God who has given to the juice of the grape properties and virtues so far surpassing what might have been expected from its humble origin, and the sterility of its native soil. 'Tis merely by the combination of the oleaginous, saline, and volatile particles of which wine is composed that the Creator has produced such effects.

How evidently is the divine goodness manifested in the abundance and the variety of wines! It is impossible to reckon up all the different kinds of wine. They vary in color, smell, taste, quality, and duration. It may, indeed, be affirmed, that there are as many different sorts of wine as there are places in which it grows. To each country the Creator hath assigned that kind of wine which is adapted to the climate, the constitution, and way of living of its inhabitants.

But how lamentable it is to observe the conduct of men with respect to wine! There have been nations, among whom the use of wine was prohibited under the severest penalties. The motive for this was not any consideration for the health or morals of the people, but rather certain principles of economy, or perhaps fanaticism. To these causes combined, is at least ascribed the prohibition of the use of wine to his followers by Mahomet. This proscription of wine was so much the more absurd, as most of the nations among whom the use of it is forbidden, are nevertheless allowed to eat grapes. Another scandalous procedure of men is the deception which they practise in the adulteration of wine, especially when lime, white lead, litharge, and

other noxious ingredients are employed for the purpose. Here the human heart is exposed in all its deformity. What, indeed, can be more horrible than such conduct? An indigent wretch, afflicted with disease, seeks to alleviate his pain, or to soothe his misery by expending a portion of his scanty pittance in the purchase of a small quantity of wine. Instead of the relief which he fondly anticipates, he is plunged into aggravated wretchedness: avarice drugs his bowl, and instead of the life-invigorating beverage, a slow poison circulates through all his veins. Another scandalous abuse of wine is that of which those are guilty who take it in excess. Wine is a medicine that supports animal life, because it contains vital spirits, which warm and animate the humors of the body, renewing its vigor and recruiting its strength. But, with the continual and immoderate use of wine, it ceases to produce these beneficial effects. This beverage is to the human body what manure is to trees. It forces the fruits, but it is detrimental to the tree. A skilful gardener is not continually applying dung to his trees, but only when they want it, and then only in such quantity as is necessary and best adapted to their nature. This is the only rule to be observed in the drinking of wine. Whoever transgresses it does injury both to his body and his soul.

Profit, then, reader, by the advice which I give you respecting the use of wine. Never partake of this gift of Providence without reflection, and merely for the pleasure of drinking it. Recollect that were it not for the bountiful providence of God, you would not have even the most necessary aliments, and that to this liberal benefactor you are indebted for this agreeable beverage, and the re-

freshment and benefit you derive from it. To his government you must ascribe it, that at the very moment when you are enjoying this pleasant liquor, some sudden change does not take place in your system, which might convert it into a poison, and a principle of death. If you reflect thus, and at the same time take into consideration the account which you will once have to give of the use you have made of the aliments with which you are supplied by the divine goodness, you will never drink so much as to stupify your soul and body, and to render yourself unfit for the fulfilment of the duties of your vocation and of Christianity. You will not make the enjoyment of wine an indispensable part of your happiness, but will sometimes abstain from the use of it, that you may apply it to the relief of the indigent or the sick. The aliments with which your heavenly Father furnishes you, will more powerfully excite your gratitude and love to the giver of all good things; and you will make use of all the refreshments he has sent, to recruit your strength and spirits, and to enable you the more cheerfully to perform the duties of your station. You will always recollect that these are the least of the benefits that God has conferred on you, and in the world to come he will recompence your piety with blessings and pleasures infinitely superior.

OCTOBER 13.

MIGRATIONS OF BIRDS.

THIS is the season when the greatest part of the birds, which, during the summer, found habitations and subsistence in our fields, gardens, and

woods, leave our climate, and repair to other countries. Very few pass the winter with us; among these are the yellow-hammer, the wood-pecker, the crow, the raven, the sparrow, the robin, the wren, the partridge, and the fieldfare. Most of the others either conceal themselves, or leave us entirely. This migration is a wonderful and interesting phenomenon; and if, during the residence of these little animals among us, we neglected to take that notice of them which they deserve, let us at least pay some attention to them now when they are taking leave of us. We shall perhaps be thereby induced to observe them with greater care when they return in spring.

Of the migratory birds, some, without taking a high flight or keeping together, proceed gradually toward the south in quest of food; but never fail to return at their appointed time. Others are called birds of passage, because they regularly assemble at certain seasons, and repair in flocks to other regions. Some species of birds merely pass from one contiguous country to another, to which they are attracted by the climate and the food; others traverse the seas, and undertake voyages of astonishing length. The most common birds of passage are the quail, the swallow, the wild duck, the plover, the snipe, and the crane; together with some other species which subsist upon insects. The quails pass in spring from Africa to Europe, to enjoy a milder temperature; and in autumn recross the Mediterranean Sea, to enjoy the more genial climate of Egypt. They fly in flocks, resembling large black clouds, through the air, and often fall, through weariness, into ships, where they are easily taken by the hand. The swallows,

in their migrations, pursue a different method. Part of them cross the sea; but many remain in Europe, concealing themselves in holes in the earth, in marshes, and other places where they are not likely to be disturbed by men or animals, fastened together, claw against claw, and bill against bill. At the approaching winter wild ducks and cranes assemble on a certain day, and repair to milder climates. They range themselves in a mass, in the form of a triangle; a single bird leading the way forms the point, every succeeding row containing a greater number. The leader cuts the air, and facilitates the passage of the others, whose bills rest upon the tails of those that are before them. For this reason he is relieved from time to time by others, and wheels from the point to the rear rank to rest. All birds of passage, however, do not fly in flocks. Some travel quite alone, others with their mates and their whole family, and others in small companies. They perform their journey in a short time. It has been calculated that they may proceed with ease five or six hundred miles a day, if they fly only six hours, which would allow them the rest of the day and the whole night for repose. According to this computation, these birds of passage can travel from our climate to the Line in seven or eight days; and this conjecture is strengthened by the appearance of swallows on the coast of Senegal as early as the ninth of October, that is, about eight or nine days after their departure from Europe.

These migrations of birds cannot be sufficiently admired. It is evident, indeed, that the revolutions of the seasons and the scarcity of food warn the different species of the feathered creation to-

change their place of abode; but how happens it that when the season is mild, and they can obtain abundance of food, they nevertheless depart at the usual time? How do the birds of passage know that they will find a plentiful subsistence and an agreeable temperature in other regions of the globe? Whence comes it that all the birds of one species leave our climate at the same time, as though they had unanimously fixed a day for their departure? How can they pursue their course without interruption amid the darkness of night, without any knowledge of the regions and the climates they traverse in their flight? These, and other questions relative to this important subject, have never been answered in a satisfactory manner; because we are yet so imperfectly acquainted with the nature and the instincts of animals. We may, however, perceive in these migrations of birds the works of a wise and bountiful Providence. What means does it employ to preserve and to nourish certain species of birds? With what tender care, and with what inimitable wisdom is it not engaged in providing for these creatures, when one region of the globe denies them what is necessary for their subsistence! This most clearly demonstrates, that in the extended empire of Nature every thing is arranged in the wisest manner. Is not instinct to the birds of passage what reason is to man? Doth not this innate impulse dictate what the faculty of reflection would teach them, if they possessed it, that is, the necessity of changing their abode?

How deeply the consideration of this part of the providence of God ought to make us ashamed of our unbelief, distrust, and anxious care! Your migrations, ye feathered tribes, shall instruct me

in my duty. How can I suffer my soul to be overwhelmed with that despondency which distress or vain apprehensions so often produce? Will not that God who directs the birds of heaven with such tenderness, manifest as much love and regard for me, whom he has deigned to endow with reason? Shall not man, appointed by God himself the sovereign of the creation, experience an equal portion of the providential care of his Creator with the inferior animals? The whole earth is the Lord's; and if he cannot here accomplish the gracious designs which he has formed with respect to me, his hand will conduct me to other regions, which are better adapted to that purpose. With cheerfulness, therefore, I will follow whithersoever he may think fit to lead me; and never chuse any paths but such as he directs. I will submit with resignation to all his decrees, which are solely designed to promote my welfare. Led by his hand I have nothing to fear, and will therefore follow him step by step, with child-like confidence.

OCTOBER 14.

VARIETY OF TREES.

We observe in trees the same variety which prevails among all the productions of the vegetable kingdom. Some are remarkable for their size, as the oak. Some are tall and slender, as the elm and the fir; and others never attain any great height, as the thorn and the box-tree. Some are rough, their bark being chapped, and its surface uneven; but others are smooth and handsome, as the maple, the poplar, and the birch. Some are

adapted to works of extraordinary beauty, which decorate the apartments of the great and the rich, while others are used for more common and necessary purposes. Some are so weak as to bend with every breeze, while others unmoved resist the fury of the northern blast. Some grow to an astonishing height and thickness, and for a century each year seems to have added to their dimensions: while others, on the contrary, arrive at their full growth in a very few years.

Pliny, in his time, admired the prodigious trees, from the bark of which boats capable of containing thirty people were constructed. What then would he have said to the kind of trees that grow in Congo, and which, when hollowed, form boats that will hold two hundred persons;* or to those, which, according to the reports of travellers, are eleven feet in diameter, and may be made to carry from twenty to twenty-five tons? A tree of Malabar is said to grow to fifty feet in circumference. The cocoa-tree is of this kind. It belongs to the class of palm-trees, the leaves of some of which are large enough to cover twenty people. The tallipot, a native of the island of Ceylon, that in height resembles the mast of a ship, is likewise celebrated for the prodigious size of its leaves, which are of

* This tree is called the seiba, or ceiba, and in height and size surpasses almost all the trees that are yet known. Some of them attain the height of one hundred and twenty feet. Their trunks are from eight to twelve feet in diameter, and they are without branches for sixty or seventy feet from the ground. It is the finest of these trees that are chosen for the purpose of making the boats mentioned by the author, which are commonly from eight to twelve feet wide, and from fifty to sixty in length. T.

such dimensions that one of them is capable of affording shelter to fifteen or twenty persons at once. When dry, these leaves are so strong, and at the same time so flexible, that they may be folded like fans. In this state they are extremely light, and not thicker than a man's arm. There are still to be seen on the top of Mount Lebanon twenty-three cedars, which are reported by tradition to have escaped the devastation of the general deluge. They might consequently be supposed to be the largest trees in the world. A traveller who went to see them, informs us that six persons could not embrace one of their number. They must, therefore, be from thirty to thirty-six feet in circumference, which appears much too little for an age of six thousand years. The gum trees of the American islands are generally twenty-six feet in circumference; which renders it highly probable that the cedars of Lebanon are not by far so old as is reported. So much is certain, that trees attain a very great age. There are apple trees which are known to be above a thousand years old.*

* The author has omitted to mention a species of tree, still more remarkable than any of the above, and which has a just claim to notice on account of the venerable age and the prodigious size which it attains. This is the baobab, or, as it is denominated by the French, the calabash-tree, a native of the tropical regions of Africa, bordering on the Senegal. M. Adanson, a celebrated naturalist, who, about the middle of the last century, resided in one of the French settlements in that part of the world, has given many curious particulars and calculations respecting the size and age of the baobab. The trunk of this tree is not very high, seldom exceeding sixty or seventy feet; but of such prodigious thickness, that M. Adanson measured some which were from seventy-five to seventy-

Variety of trees.

This great diversity of trees reminds me of the variety which we observe among men, in regard to the station they occupy, their talents, qualities, and way of thinking. As there is not a tree in the forest but what is of some use to the owner, if it is only sound, so there is not an individual in human society who may not be of some service to his fellow-creatures. One, like the oak, commands admiration for his unshaken firmness and constancy; he bends to no man. Another is endued with less fortitude; he is more complaisant; he is all things to all men; he is flexible as the weeping willow, and bows at every breath. If he possesses integrity, he manifests this pliancy of disposition only in what is honest and virtuous; but if he is indifferent to the precepts of God, and the dictates of his duty and his conscience, he is always the adherent of that party which has power on its side.

Whatever difference there may be among trees, they all belong alike to the proprietor of the soil;

---

eight feet in circumference; that is, twenty-five or twenty-six in diameter. These he calculates, from such data as he could collect, to be three thousand seven hundred and fifty years old. Following the same ratio, he conjectures that a tree thirty feet in diameter must have existed upwards of five thousand years. The futility of these calculations must be apparent when the reader is informed that M. Golberry, who in 1786 visited this part of Africa, found one of these trees of such enormous size as to be one hundred and four feet in circumference, or thirty-four feet in diameter. Adopting Adanson's hypothesis, the origin of this patriarch of African vegetables would be removed back to a period antecedent to the creation. In the trunk of this tree the hand of time had formed a cavity more than twenty feet high, and nearly as many square; though in every other respect it exhibited all the signs of a green and vigorous old age. T.

they are all nourished by the same earth, refreshed by the same rains, and cheered by the same sun. Would to heaven that all men, notwithstanding the difference there may be among them, would acknowledge that they are all the creatures of God, who are alike fashioned by his hand, subject to his power, endued with the same faculties, and equally the objects of his paternal solicitude and providential care! The cedar proudly towering on the summit of Lebanon, and the bramble-creeping at its foot, are equally independent; they are nourished alike by the aliment they receive from the earth, and by the rains of heaven. In this respect the rich and the poor are perfectly equal. The most exalted of men ought always to recollect that it is to God alone they owe all their grandeur; that they are supported by his Providence; and that, whenever he pleases, he can sweep them from the face of the earth. Such thoughts would tend to repress every emotion of pride, and inspire them with that submission and obedience which are due to the author of their existence.

OCTOBER 15.

OF THE TEMPERATURE IN DIFFERENT CLIMATES OF THE EARTH.

It might be supposed that the temperature of countries depended in a great measure on their relative position to the sun, since the rays of that luminary fall in a similar manner upon the regions which lie under the same degree of latitude. Experience, however, teaches us that Nature follows totally different rules; and that not only heat and

cold, but all the other variations of weather depend on many other circumstances. The seasons may be very different in places under the same parallel; and, on the contrary, they are sometimes very nearly alike in places that lie in very different latitudes. As, therefore, accidental causes may produce a great variation of temperature in the same latitude, and since the climate of places is not found to be such as might be expected from their distance from the sun, and their situation with respect to that luminary, it is difficult to determine precisely the seasons and temperature of every country.

The vicinity of the sea renders the climate milder. Of the truth of this observation, England and the Norwegian coasts afford irrefragable proofs. The sea may sometimes be frozen near the shore, where it receives a copious influx of fresh water; but this does not take place at any considerable distance from the land, partly on account of the saltness of the sea, and partly on account of its continual agitation. The sea, therefore, being never reduced to the freezing point in winter, imparts the mildness of its temperature to the adjacent countries. On the other hand, a place is so much the colder, the more it is elevated above the surface of the sea. The air in those situations is not only more rare, and consequently colder, but the greatest part of the heat, produced by the reflection of the sun's rays from the earth, is confined to the low places and vallies, which are always the warmest. Quito is situated almost immediately under the Line, but on account of its elevation, the heat is moderate. For the rest, such places have in general a light and serene air, and a very equal temperature. High hills attract clouds, and hence rain and storms

are more frequent in hilly countries than in plains. In Arabia, which is one uninterrupted plain, it scarcely ever rains. Countries which contain numerous and extensive forests are extremely cold. The ice there melts more slowly in winter, because the action of the sun's rays is obstructed by the trees. The ice cools the super-incumbent air, by which its dissolution is still more retarded.

What farther tempers the heat in warmer regions is, that the days are not very long, and the sun is consequently a shorter time above the horizon. In colder countries, the days of summer are very long, which occasions the heat to be greater than would be expected. The long nights are rendered more supportable by the serenity of the sky, the brilliant light of the moon, and the long twilight. In the torrid zone the year is not divided into summer and winter, but rather into the dry and the rainy season: for at the period when the sun is most elevated above the horizon, and when we should expect summer, the rainy season sets in, and continues for a longer or a shorter time. On the other hand, the most agreeable season in these countries is when the sun is the lowest. In the countries without the tropics, the weather is in general more variable than in those which lie within them. High winds are most common in spring and autumn. In winter the earth freezes more or less deep; in our climate seldom more than three feet. In more northern regions it freezes to a much greater depth, and thaws only a few feet during the summer. Standing waters, and then rivers are covered with ice, which first begins to be formed near the shore, and by degrees extends over the whole surface. The varieties of the soil, and the faculty of retain-

ing heat for a longer or shorter time, likewise contribute something to the difference of climate.

In all these arrangements are manifested the admirable wisdom and goodness of God. By thus regulating the seasons and the temperature of the different regions of the globe, the Creator hath rendered every part of it fit for the habitation of men and beasts. The generality of people form erroneous opinions concerning the torrid and the frigid zones; and, according to these, the inhabitants of those regions must be the most unfortunate wretches on the face of the earth. But fortunately for the world, and to the sincere satisfaction of the philanthropist, the people of the most remote countries, not excepting those who live under the Line or beneath the pole, enjoy as large a portion of happiness as is consistent with their nature and destination. Every place has its advantages and its disadvantages, which are in general so equally balanced that it is difficult to determine which deserves the preference, unless we are governed in our decision by certain secret partialities. There is not a spot on the whole earth where the Creator hath not manifested his wisdom and his beneficence.

From the regions in which we dwell to the most distant zones, the earth teems with the bounty of the Lord; and all the inhabitants of the globe are the objects of his paternal care. To each of his creatures he hath assigned its portion of happiness and enjoyment, and not one of them has been forgotten in the general distribution. From him all that breathes receives life, happiness, and abundance.

OCTOBER 16.

OF THE ATMOSPHERE OF THE EARTH.

THE earth is surrounded with air, which is not so pure and subtle as the ether; but being impregnated with particles and exhalations continually detached from the land and the waters, it is consequently more impure and more dense. This air is called the atmosphere of the earth; and its inferior region, or that which is immediately above the earth, is compressed by the superincumbent air, and is consequently more dense than the latter. This is found to be the case by those who ascend lofty mountains, where respiration is found more difficult the higher they proceed. It is impossible to ascertain the exact height of the atmosphere, because we cannot ascend to a sufficient elevation in the air; neither can it be inferred with certainty from the duration of the twilight. For supposing that the morning twilight begins, and the evening twilight ends when the sun is eighteen degrees below the horizon, and that the latter is produced by the rays of the sun which reach the earth, and are refracted by the highest parts of the atmosphere, still many difficulties will remain to be explained. Be this as it may, the atmosphere is divided into three regions. The lower region extends from the earth to such a height where the air is not heated by the rays reflected from the earth. This region is consequently the warmest. The middle region begins where the former terminates, and reaches to the summits of the most lofty mountains, or even to the most elevated clouds; so that it is the place in which rain, hail, and snow are generated. This region is much

colder than the lower, for it is warmed only by the rays which pass directly through it. The third, which extends from the middle region to the utmost limits of the atmosphere, is probably still colder. It is impossible to fix the exact boundaries of any of these regions.

The particles which rise from the earth into the atmosphere are of various kinds. Some are aqueous, others earthy, metallic, or sulphureous. As some of these are more abundant in one region than in another, this occasions a great difference in the air, which is often perceptible at a small elevation. A heavy air is more favorable to health than a lighter; because in the former the circulation of the blood and the insensible perspiration meet with less obstruction than in the latter. When it is heavy, it is commonly serene; but a light air is always accompanied with clouds, fog, rain, or snow, and is consequently humid. Vapors increase the gravity of the air, and when they rise to a great height in hot weather, the air is very light, notwithstanding the aqueous vapors with which it is charged. Too dry an air operates powerfully on the human body, and is extremely prejudicial; but it is seldom met with, except in sandy countries. A very moist air is equally unwholesome, relaxing the system, obstructing insensible perspiration, and disposing the humors to putrescence. When the air is very hot, it dilates all the fluids of the human body, produces copious perspiration, which is succeeded by languor and debility. When it is very cold, the solids are too much braced, the fluids are condensed, and obstructions and inflammations are the consequences. That air is therefore the most salubrious which is rather

heavy than light, neither too dry nor too moist, and which is least charged with noxious exhalations.

In the atmosphere clouds, rain, snow, dew, thunder and lightning, and various other meteors are engendered. As the rays of light are refracted in the atmosphere, we are enabled by it to see the sun's rays some time previous to the rising, and after the setting of that luminary. Hence arises the morning and the evening twilight: and hence also the natives of the polar regions enjoy the sight of the sun in winter, even when he is still below their horizon. The atmosphere is the abode of the winds, which have such a powerful influence on the fertility of the earth, and the health of man. Cities and provinces would soon be deprived of their inhabitants, and converted into dreary deserts, if the air were to repose for any length of time without motion upon the earth. The wide world would soon be one universal cemetery, if there were no tempests to disperse the vapors which are continually rising from so many stagnant waters, and the exhalations emitted by men and animals, and to replace them with a more pure and salubrious air.

What abundant reason have you, then, reader, to adore your Creator for this bountiful arrangement of Nature! Supposing that the atmosphere of the earth either did not exist, or that it was of a different nature from what it actually is, the globe would be an uninhabitable chaos, or a dreary abode for every species of creatures. Acknowledge, therefore, with gratitude the wise providence of God, who has regulated all Nature in the manner best adapted to the pleasure and happiness of the beings

whom he has formed. When you are enjoying the benefits which yourself and your fellow-creatures derive from the atmosphere of the earth, reflect that from God all good things in Nature proceed; and then indulge those feelings of gratitude which the consideration of the works of God cannot fail to excite. Praise your Creator, and love him with all your heart and with all your mind!

OCTOBER 17.

PROPORTION BETWEEN BIRTHS AND DEATHS.

THAT God has not left the lives of men and the preservation of the human race to blind chance; but that he watches over us with truly paternal care is evident from the exact proportion in which men enter and quit this stage of existence, in every country and in every age. By means of this arrangement the population of the earth is so regulated, that the globe can never be overstocked with inhabitants.

The number of births almost always exceeds that of deaths. It is observed that for ten persons who die annually, twelve or thirteen are born. Thus the human race is constantly upon the increase. If this were not the case, and the number of deaths were to exceed that of births, a country would necessarily be depopulated in the course of a few centuries; particularly as the multiplication of the species is liable to be prevented by various circumstances. The principal of these is pestilence; after which follow war, famine, celibacy, and lastly, large cities, especially the most populous, in which at least as many persons die as are born.

Proportion between births and deaths.

The baptismal registers prove that more males than females are born. For twenty girls there are always twenty-one boys; so that for one thousand children of the female sex, one thousand and fifty are born of the other. But death, war, and various accidents to which men are exposed, again reduce the sexes to an equality. In towns females are in general the most numerous; but in the country the males preponderate.

The number of children relatively to the number of families, is likewise regulated with the greatest wisdom. In sixty-six families it is computed that only ten children are annually christened. In a populous country only one person out of fifty or fifty-four marries in a year, and each marriage produces on an average not more than four children. In cities only thirty-five children are reckoned to ten marriages. The men who are capable of bearing arms generally constitute one fourth of the inhabitants of any country.

On comparing the bills of mortality of different countries, it appears that in common years, that is, in those during which no epidemic disorder has prevailed, one person in forty dies annually in villages; in small towns one in thirty-two; in middling towns one in twenty-eight; in very populous towns or cities one in twenty-four; and in a whole province one in thirty-six. In one thousand people twenty-eight die every year. Of one hundred children that die annually, three are still-born; but scarcely one in two hundred dies in the birth. In one hundred and fifteen deaths there is only one woman in child-birth; and out of four hundred deaths but one happens in labor. The greatest mortality takes place among children from the period of

their birth till they are a year old. Out of one thousand children, two hundred and ninety-three die in the first year, only eighty in the second, and not more than two in the thirteenth, fourteenth, and fifteenth year. This is consequently the least dangerous period of human life. It has been observed that more women than men attain the age of from seventy to ninety years; but that more men than women live to be ninety or one hundred years old.

It is calculated that at least three thousand millions of people might live at once upon the earth. It contains, however, scarcely one third of that number, or, at most, but one thousand and eighty millions. Of these, six hundred and fifty millions are in Asia, one hundred and fifty in Africa, the same number in America, and one hundred and thirty millions in Europe.

The most natural inference that I can draw from this is, that God has the most tender solicitude for the life of man, and that it is exceedingly precious in his sight. How could the number of births and deaths be so equally balanced, and how could their proportion be so exactly preserved in all places and in all ages, had it not been thus ordered by the wisdom of the Almighty?

OCTOBER 18.

DESTRUCTION IN THE EMPIRE OF NATURE.

We now see that beautiful Nature, which, in spring, delighted all our senses, is subject to the general fate of all created things. Her charms are fled; every day produces changes more and more

disagreeable: but such is the lot of Nature. She produces in her own bosom the causes of the most lamentable devastations.

What ravages are occasioned by the inundations of seas and rivers, by heavy rains, and the melting of ice and snow. Whole villages swept away, fruit-trees uprooted, corn-fields desolated, flocks and herds destroyed, present to our view melancholy monuments of the destructive force of the elements. A shipwreck appears to be a less fatal catastrophe: but all those who have thus perished, and been entombed in the deep, would form a numerous commonwealth. Prodigious sums, perhaps the collection of ages, are in a moment engulphed. Whole families are stripped by a shipwreck of their all; while the aspect of the perturbed ocean, the cries of the dying mariners, and the crash of the shattered vessel, are of themselves sufficient to chill the soul with horror. What devastations are occasioned by excessive heat and long-continued drought! The herbage and vegetables languish, the earth is parched, and its inhabitants are suffocated with the burning dust. The waters become putrid, and are converted into a baleful poison for the flocks and herds. The insects multiply prodigiously in consequence of the heat and putrefaction; they consume the produce of the earth; and if they die to-day, they revive to-morrow in a new generation. Famine, the ghastly friend of Death, and her hideous sister, Pestilence, stalk over the land. Such are the evils resulting from one unproductive year, from war, or contagious disease. How dreadful and destructive are the ravages of earthquakes! Even from within the bowels of the earth consuming fires spread death and dismay over

the creation. Suddenly, and often at the dead hour of midnight, the earth is convulsed, cities are levelled with the ground, and thousands of sinners are buried in their ruins. How tremendous is the spectacle presented by volcanoes and conflagrations!

Thus Nature, in other respects so lovely, appears sometimes in a terrific form. The first thought that occurs to my mind on contemplating these awful scenes is this: How defective is every thing but the Creator himself! Many people make Nature their God, and her beauties render them insensible to him, from whom they are only emanations. This consideration makes me acquainted with the true state of all natural things, and likewise with the advantages which the love of God has over every earthly object to which our hearts can be attached. To take delight in the contemplation of his august attributes, to enjoy a portion of his grace, and to feel that he is the supreme good,—this it is that will enable us to triumph over all the devastations of Nature. I am encouraged, even in this life, to form the most pleasing conceptions of the Deity, when I see that he causes the greatest natural calamities to answer some beneficial purpose. How often do these convulsions of Nature prevent much more fatal evils, which must inevitably have resulted from a still greater accumulation of combustible substances in the bosom of the earth. Volcanoes and inundations are often the means of preventing more destructive calamities! Nothing but an intense heat was capable of drying the earth, yet immersed in many places beneath the deluge of waters. How many useless and wicked inhabitants are swept by pestilence and hunger from

the face of the earth! How many evils that would arise from too numerous a population, are obviated by the mortality which sometimes prevails among mankind! Nevertheless, I am of opinion that God would not have introduced so many calamities into the system of Nature, had they not been designed as punishments for the wickedness of men.

When I am only a spectator of the devastations which sometimes happen, and am not immediately interested in them, my heart should be so much the more susceptible of sentiments of gratitude and sympathy. I will never be insensible to the woes of others, nor coldly contemplate the miseries occasioned by remote calamities, as if I could be affected by nothing but what personally concerned me. Shall every link in the great chain of the universe accomplish its destination, and I alone remain inactive? Were the unfortunate people who are involved in such calamities greater sinners than myself? Is the place in which I live less contaminated with guilt than the regions that are laid waste by earthquakes and volcanoes? How tremendously awful will be the last convulsions of Nature! The world is not eternal: it is gradually approaching the final catastrophe. Nature still flourishes, but we may perceive the commencing wrinkles of old age. A thousand arts are now required to extort from her that boon which she bestowed almost unsolicited upon our ancestors. Perish then, if perish thou must, O land of my pilgrimage! I have here no permanent residence, but I know that a mansion is reserved for me in a city, of which the Most High himself is the architect.

Ye desolated countries, cities and villages, how sincerely I deplore your fate! Would to heaven that I possessed the power to rescue you, that I were near enough to divide my bread with you, their unfortunate inhabitants! How gladly would I contribute toward your relief! Bow with humility to the all-powerful hand of God, and bear with patience the calamities which he sends. Reflect how many of your fellow-creatures have been involved in similar afflictions. Their wounds are healed, their barns are fuller than ever they were, and palaces have sprung up from the ashes of their former habitations. To destroy and to create, is, and will be till the end of time, the prerogative of God. Were he never to destroy, we should not behold so many glorious instances of new creations; we should lose many occasions of exercising the virtues of resignation and patience, and of learning the value of a religion which renders us superior to all sublunary things. Let us deeply impress upon our hearts this truth, that "God saw every thing that he had made, and behold, it was very good!"

Yes, Lord, thou art clothed with majesty and resplendence; holy and just are thy judgments, and all thy works are grace and truth. Who can be so blind as not to perceive thy power and thy wisdom in each of the productions of thy hand; and who can refrain from extolling thee with transports of profoundest gratitude, O Sovereign of the universe!

OCTOBER 19.

CIRCULATION OF THE BLOOD.

Of all the motions which we observe in the animal body, none is more important or more mysterious than the circulation of the blood. In this motion there is a certain striking grandeur, which makes us sensible of the narrow limits of human intelligence, and inspires us with the most profound veneration for the infinite wisdom of its divine author.

The cause of the continual circulation of the blood through every part of the body is as follows:—The heart, which is situated in the middle of the chest, between the lungs, is a muscular machine, containing two cavities, separated from each other by a partition. This machine is in a continual motion, consisting of an alternate contraction and dilatation. From the left ventricle of the heart proceeds the trunk of an artery, denominated the aorta, or great artery. It soon divides into several branches, some of which ascend and others descend, and whose numberless ramifications, becoming smaller and more delicate the farther they are from the heart, penetrate into the remotest parts of the body. The left ventricle by its contraction discharges the blood into these arteries with such force, that it is propelled to the extremities of the last ramifications. But what becomes of the blood when it is thus distributed? Some of the vessels through which it passes separate from it the watery, others the oily, and others the saline parts. In other parts of the body through which the arteries are carried, are secreted milky, fatty, or other humors, which

are either designed to answer particular ends, or to be expelled as useless from the body.

That part of the blood which remains after being thus purified, runs so gently into the extremities of the smallest arteries, that, with the microscope, we may plainly distinguish the red globules rolling along one after another. The ends of the arteries are the beginnings of the veins, which, uniting as the arteries divide, at length form large trunks, through which the blood returns from all quarters to the heart, in the same manner as it was propelled from it through the arteries. These veins convey back the blood from the superior as well as the inferior parts of the body to the heart, where they unite in one short trunk, which discharges the blood into the right ventricle. Thence it does not immediately pass into the left ventricle, but it is thrown by the contraction of the heart into an artery which conveys it, by an infinite number of small ramifications, to every part of the lungs. Here the blood which has circulated throughout the whole body, and has become heated by the friction, is cooled previous to a new circulation, by the air which we inhale into the lungs; and by this refrigeration it is condensed, after having been greatly expanded by the heat acquired in its course.

Such is the admirable contrivance of the circulation of the blood in man, and in most known animals. But how much of it surpasses our comprehension! We meet with nothing but wonders, which convince us that the human understanding is incapable of embracing this master-piece of the Creator.*

* "The wisdom of the Creator," observes Dr. Keill, "is

Circulation of the blood.

Man, whose supremacy is acknowledged by the whole earth, is a marvellous piece of workmanship. In him are combined the most admirable mechanism and the most exquisite corporeal beauty; and each member declares him to be the lord of the creation. An innumerable multitude of invisible tubes, fashioned and arranged with skill infinitely superior to human art, convey, distribute, and circulate the life-sustaining fluid through every part of his frame. In this wonderful composition nothing clashes, and nothing is out of place, nothing is defective, and nothing superfluous; nothing is too slow, and nothing too rapid in its movements!

This circulation, which we may remark in the body of every living creature, obtains throughout all nature. The sun, the moon, and the stars perform their appointed courses with a regular and uninterrupted motion. The meaner elements also are in continual circulation. The air is not only in constant motion, being impelled in all directions about the earth, but water likewise performs its destined revolution without ceasing. The rivers

in nothing seen more gloriously than in the heart."—"And how well," continues a late popular writer of our own country, "doth it execute its office! An anatomist who understood the structure of the heart, might say beforehand that it would play: but he would expect, I think, from the complexity of its mechanism, and the delicacy of many of its parts, that it should always be liable to derangement, or that it would soon work itself out. Yet shall this wonderful machine go, night and day, for eighty years together, at the rate of a hundred thousand strokes every twenty four hours, having, at every stroke, a great resistance to overcome: and shall continue this action for this length of time without disorder and without weariness." (*Paley's Natural Theology.*) T.

pour their currents into the sea; and from the vast surface of ocean rise those vapors which form clouds, discharge themselves in rain upon the earth, penetrate mountains, and feed the springs, which, augmenting by degrees, swell to rivers, and again roll their torrents to the parent ocean. The earth is incessantly expending its fertility in the growth of the plants and harvests which it annually produces; and yet it is never exhausted, because its losses are recruited by the incessant circulation of nutritive particles. All these obvious revolutions in Nature conduct us to a first cause, whose wisdom hath so regulated the earth, that all things move in a mazy labyrinth of changes, till they return to their original plan, and anew commence their prescribed career.

OCTOBER 20.

PROPORTIONS OF THE DIFFERENT PARTS OF THE HUMAN BODY.

GOD hath formed the human body according to the wisest plan, and hath observed the most exact proportion, even in the smallest parts. To be convinced of this, we need only calculate the height and the bulk of the human body by a certain fixed standard. The height of the body is commonly divided into ten equal parts, which in technical language are called faces, because the human face was the first standard made use of to measure it by.

The first face comprizes the whole of the visage, beginning at the point where the hair commences on the forehead. From this point to the top of the head is one third of a face, or, what amounts to the

same thing, a space equal to the length of the nose. Thus the whole head, from the crown to the chin, comprehends one face and one third. From the extremity of the chin to the cavity of the collar-bone above the chest is two thirds of a face; so that the space from the breast to the crown of the head is equal to two faces, or the fifth part of the whole length of the body. From the cavity of the collar-bone to the bottom of the breast is reckoned one face. The fourth begins below the breast, and ends at the navel, and the fifth reaches to the extremity of the abdomen, making altogether half the length of the human body. The length of the thigh to the knee is two faces. The knee makes half a face: and in the leg from below the knee to the instep there are two faces; which form in the whole nine faces and a half. From the instep to the sole of the foot is half a face, that completes the ten faces into which the human body is commonly divided. This division is adapted to the generality of men; but those who are of more than usual height have about half a face more in that part of the body between the breast and the pubis, and it is the superior length of this part that constitutes extraordinary stature. When the arms are extended so as to form a straight, horizontal line, the distance between the extremities of the middle fingers is equal to the length of the whole body. From the hollow between the collar-bones, to the joint that unites the shoulder-bone to the arm, is one face. When the arm depends its whole length, it is reckoned at four faces: that is, two from the shoulder-blade to the elbow, and two from the elbow to the tip of the little finger. This makes five faces for each arm, consequently the length of both is equal to that of

Proportion of the parts of the human body.

the whole body. The hand is one face in length. The thumb is equal to one third of a face, or the length of a nose, as is likewise the great toe. The length of the sole of the foot is one sixth part of the height of the whole body. In like manner the body and the members bear a certain proportion to each other in bulk. The thickness of the thumb is commonly the thirty-sixth part of the whole length of the body, and the thickness of the little finger one forty-eighth. Thrice the thickness of the thumb is equal to that of the wrist, and six times the thickness of the wrist gives the bulk of the whole body.

The height of the human body differs considerably. The tall stature is from five feet eight inches to six feet, and upwards; the middling stature is from five feet two or three inches to five feet eight; and the little size is from five feet two inches downwards. Women are in general two or three inches shorter than men; their breasts are more prominent and elevated, so that the cavity of the chest formed by the ribs is deeper in women and broader in men, in proportion to the rest of the body. The hips of women are likewise much larger than those of men; because the hip-bones, and those united to them, forming together the space called the pelvis, from its resemblance to a basin, are much broader than in the other sex. Man has a greater proportion of brain than any animal of equal dimensions, even more than the horse and the ox. A man who weighs one hundred pounds, has, in general, four pounds of brain. The weight of children born at their full time seldom exceeds eight pounds, or is less than five. Their greatest length is one foot eleven inches, and the least one foot six inches.

Thus the human body, considered either as a

whole, or in its parts, is formed with the most exact proportion. Every thing in it is arranged with exquisite harmony and regularity, both with respect to its size and figure, and also the situation of its parts. No part is larger or smaller than its connection with other parts, and their mutual advantage require. In like manner, the figure and situation of each is the most convenient and suitable, both for itself and for others, that can possibly be conceived. It is, nevertheless, certain that varieties and irregularities may occur, without frustrating the principal design of the body, as is demonstrated in the production of monsters and deformed persons. But if these, and such like deviations of the parts in thickness, figure, and length, from the rules according to which our bodies are formed, are not incompatible with the great ends for which they were designed, they, however, diminish their beauty and their elegance. Oh! that my soul were as beautiful in the eyes of the Lord, as my body is in the eyes of men; and that the same perfect harmony prevailed between them, as subsists between the different members of the latter. Then should I be well pleasing in thy sight, and with soul and body praise thee, my Creator and my Redeemer!

OCTOBER 21.

OF NAVIGATION.

To a reflecting mind, navigation is a subject that may afford occasion for the most interesting considerations. Our curiosity is excited, and at the same time gratified by it in various ways; and

hence arises a new and abundant source of pleasure. We in general contemplate in navigation only the advantages it procures us; but we ought also to bestow some notice on the mechanism and the motion of the ships, without which there would be no navigation.

Is it not truly astonishing that a body of such prodigious size and weight as a ship, can float upon the water? The weight of a ship is more considerable than we may think. A little attention will convince us that the pressure of a vessel upon the water must be astonishingly great.—Figure to yourself a majestic, floating edifice, the result of the ingenuity and united labor of many hundreds of hands, and composed of a great number of well-proportioned pieces, nicely fastened together by means of iron nails and bolts, and rendered so tight with tow and pitch that no water can penetrate it. Now, in order to give motion and direction to this enormous machine, some astonishingly lofty pieces of timber have been fixed upright in it, and so many moveable cross-pieces have been added, together with a variety of pieces of strong canvas, for the purpose of catching the wind, and of receiving its impulse and propelling power, that their number amounts to upwards of thirty. For changing the directions of these yards and sails, according to particular circumstances, it has also been requisite to add a vast quantity of cordage and tackling; and nevertheless, all this would not be sufficient for the government of the vessel, if there were not fastened to it, by means of hinges and hooks, a moveable piece of wood, very small, indeed, in proportion to the whole machine, but the least inclination of which to either side, is sufficient to give immedi-

ately a different direction to this prodigious mass, and that even in a storm, so that two men may direct this swimming island with the same, or greater ease, than a single man can govern a boat. But if we besides consider that in a vessel like this, not a single piece is put in at random, but that every part of it has its determined measure and proportion, and is fixed precisely in that place which is most advantageous for it, that throughout every part are distributed an astonishing number of blocks, stays, and pullies, for the purpose of diminishing the friction, and accelerating the motion of these parts; that even the bellying and vaulted part of the fabric, together with its sharp termination underneath, are proportioned according to the nicest calculations, and the most accurately determined rules; that the length and the thickness of the masts, the size of the booms and yards, the length, width, and strength of the sails and tackling, are all in due proportion to one another, according to certain rules, founded upon the principles of motion;—when we consider all this, I say, our admiration increases more and more at this great masterpiece of human power and understanding.

Still, however, a few traits are wanting to complete this description. A man in health consumes, in the space of twenty-four hours, about eight pounds of victuals and drink; consequently eight thousand pounds of provisions are required each day in such a ship. Let us suppose her to be equipped for three months only, and we shall find that a ship carrying one hundred guns, and nine hundred men, must be laden with seven hundred and twenty thousand pounds of provision. A large forty-two pounder weighs about six thousand one

hundred pounds, if made of brass, and about five thousand five hundred, if of iron; and on board a ship of one hundred guns, there are generally twenty-eight or thirty of these, which, exclusive of their carriages, must weigh one hundred and eighty-three thousand pounds. On the second deck there are thirty twenty-four pounders, each of which weighs about five thousand one hundred pounds, and therefore altogether one hundred and fifty-three thousand. The weight of the twenty-six or twenty-eight twelve-pounders on the lower deck, amounts to about seventy-four thousand five hundred pounds; that of the fourteen six-pounders on the upper deck to about twenty-six thousand six hundred; and besides that, on the round-tops there are even three-pounders and swivels. Now, if to this we add that the complete charge of a forty-two pounder weighs about sixty-four pounds, and that, at least, upwards of one hundred charges are required for each gun, we shall find this to amount to nearly the same weight as the guns themselves. In addition to this, we must reflect that every ship must have, by way of providing against exigencies, at least another set of sails, cables, cordage, and tacklings, which altogether amount to a considerable weight. The stores likewise, consisting of planks, pitch, and tow; the chests belonging to the officers and sailors; the surgeon's stores, and various other articles requisite for a long voyage; as also the small arms, bayonets, swords, and pistols, are no inconsiderable load. To this we must finally add the weight of the crew, which is not very trifling, and we shall find that one of these large ships carries at least two thousand one hundred and sixty-two tons burden, or four million,

three hundred and twenty-four thousand pounds; and yet this enormous mass is wafted along by a gentle breeze. How can this be possible? Is it not contrary to the laws of Nature?

No, my dear reader; this circumstance so perfectly accords with the principles of Nature, that it would be a miracle were the contrary to take place. It is not the wind alone that impels this mass; the ship, with her whole cargo, floats upon the water. But how happens it that a body so prodigiously heavy does not sink? How can the water, whose particles are not adhesive, possess sufficient force and solidity to support such a mass? This is the effect of equilibrium: the vessel sinks till the volume of water which she has displaced is equal to herself in bulk. Suppose the ship to be one hundred and twenty feet in length, and fifteen in breadth, when she sinks two feet, she displaces three thousand six hundred feet of water, to make room for an equal quantity of merchandize. Consequently the river is not more burdened with the ship than with the water, whose place she occupies.

Navigation was formerly much more dangerous and laborious than at present. Mariners durst not venture far into the open sea, but confined themselves to coasting along the shore. Since the invention of the compass, they cross the seas with greater confidence and security. Before the discovery of the loadstone and the magnetic needle, a short voyage was deemed a most extraordinary undertaking. In Homer's time, a general council of the chiefs was summoned to deliberate on the arduous enterprize of crossing the Ægean Sea. Nay, some centuries before, the expedition of Jason and the Argonauts to Colchis, was regarded as a wonder of

the world,—and what were these in comparison of the voyages of modern times? To find the straightest and the shortest way over an ocean of sixty or eighty degrees in longitude, and thirty or forty in latitude, or across a track from four to six thousand miles in extent, by day or by night, in fair weather or in foul, as well when the sky is overcast as when it is clear, and often with no other guide than the compass, which does not even point due north in all places; and to be able to determine the position of the ship at sea by the height of the sun, though that luminary be enveloped in clouds; or to steer by the moon and stars with such exactness and precision as not to make a mistake of the value of half a degree, or thirty miles; this, at least, shews the great and astonishing progress made in the art of navigation by the aid of modern ingenuity and invention.

Have you, reader, ever reflected on the benefits derived from navigation; and have you ever thanked your Creator for them? In whatever condition you may be placed, to navigation you are indebted, either directly or indirectly, for a great portion of the necessaries of life. Without it you would be deprived of all the spices and medicines which you receive from distant countries; or, at least, you could not procure them without very great difficulty and expence. How uncomfortable should we be, were all our necessaries conveyed to us by land! Of this we shall be convinced by the following calculation. The freight of a ship is reckoned by tons: a ton is equal to two thousand two hundred and forty pounds; so that a ship of six hundred tons carries a cargo of one million three hundred and forty-four thousand pounds. Reckoning half a

ton to a horse, the carriage of this cargo by land would require three hundred carts with four horses, at least the same number of men, and twelve hundred horses. But how then could we obtain most of the treasures of the remote regions of the globe? What a price we should be obliged to pay, even for the most indispensable necessaries of life! In another point of view navigation ought to be considered as one of the most signal blessings of the Creator, when we reflect that, by its means, the gospel of Christ has been promulgated among the most distant nations. To me, at least, this circumstance affords a subject of gratitude to God: and on the other hand, I praise the dispensations of his Providence for having assigned me a vocation, by which I am not compelled to brave the billows of ocean, and to expose my life to continual danger, to amass riches, or merely to procure a scanty subsistence. This consideration the more powerfully excites me to commend to the divine protection all those who are obliged to traverse the seas, and for the benefit of society, and consequently for my benefit, to perform the most dangerous voyages.

OCTOBER 22.

BEASTS OF BURDEN AND DRAUGHT.

ARE we not guilty of ingratitude in not taking more notice than we do of these animals, from which we derive so many advantages? We are, in general, satisfied with making them subservient to our purposes, either to increase our stock of provisions by their multiplication, or, by availing ourselves of their strength, to acknowledge our own weak-

ness; but we neglect, from indolence or ignorance, to consider the connection they have with the rest of the creation, or minutely to examine the traces of the divine wisdom and goodness, which are so visibly displayed in the production of these useful animals. Perhaps, reader, the following reflections may direct your attention to this part of the creation, and excite your heart to meditate with gratitude on the wisdom and goodness of our God.

Of all domestic animals, the horse renders us the greatest and the most willing services. He assists to till the ground, he carries for us every thing we want, submits with the utmost docility to every kind of labor, and shares with us the pleasures of the chace, and the dangers of war, content if he receives a moderate supply of food. He is a creature that, unmindful of himself, resigns his whole being to the will of another; that anticipates the commands of his master, which he executes with astonishing promptitude and precision; that delivers himself up entirely to his rider, that refuses nothing, sometimes even makes exertions beyond his strength, and dies in the act of obedience. Nature has given him a disposition to love and to fear man, and a sensibility alive to the caresses which lighten his slavery. Of all large animals, the horse excels in the symmetry and proportion of his parts, and in the regularity and beauty of his whole figure. The exact proportion of the parts of his head give him a brisk and lively appearance, which is heightened by the beauty of his neck. His carriage is noble, his gait majestic, and all the members of his body, nay, even its ornaments, seem to announce fire, strength, courage, and pride.

The ox is far from possessing the graceful figure

of the horse. His large head, his legs too short and too slender in proportion to the bulk of his body, the smallness of his ears, his stupid look, and heavy gait, render his appearance less pleasing; but these little imperfections he compensates by the important services which he renders to man. He is strong enough to draw very heavy burdens, and is satisfied with the meanest fare. Every part of this animal is useful; his blood, his hide, his hoofs, his horns, his flesh, his fat, are all employed for a variety of purposes. His very dung is destined to contribute toward our subsistence; being a manure that fertilizes the earth, and restores to it the virtue it has lost by its numerous productions. In this animal the structure of the organs of digestion is very remarkable. He has four stomachs, the first of which is large enough to contain forty or fifty pounds of food; the third has eighty-eight folds, which assist the process of digestion: while that of sheep and goats has only thirty-six.

The ass, however unprepossessing his exterior, nevertheless has some excellent qualities. He has not the fire and impetuosity of the horse, but is quiet, natural, and unassuming. He has no pride, cuts no capers, carries his burden without noise; is content with the coarsest food, such as thistles, or the most common herbs; is patient and indefatigable in the service of his master.

How is it possible that we can daily use these animals, without thinking at the same time of the Creator who has formed them, and endued them with the qualities which render them so useful to us? To a reflecting mind it appears an important benefit, that the number of beasts of burden and draught far surpasses that of wild beasts. Were

these to multiply as fast as the others, the earth would soon be converted into a desart. Can you, reader, reflect without gratitude on the goodness of God, who has given you the dominion over all these creatures, the ability to change their nature, to render them tame, to enforce their obedience, and to make use of them for any purpose you think fit. This command over animals is a gift of God, which ought every moment to remind man of the superiority of his nature. At the same time, had not the Almighty impressed upon these animals a fear of man, such is their strength that it would be impossible for us to tame them by force. Since, then, it is to God himself that we are indebted for this dominion, how extremely unjust it would be to abuse this power by our ill-treatment of these creatures, either in working them beyond their strength, or in exercising upon them any other species of cruelty.

OCTOBER 23.

WINTER-CORN.

A GREAT portion of the food destined for man and beast is now committed to the earth, the husbandman having sown his winter-corn. He has now some time for repose, and has the pleasure of contemplating his fields gradually overspread with the most beautiful verdure, that promises an abundant harvest. Nature, indeed, first labors in secret, when the germs are unfolding; but her operations may be discovered by taking out of the earth some of the seeds that are beginning to shoot. Two days after the seed has been sown, the grains

swell, the juices are communicated to the germ, and make it shoot. The germ is always situated at one of the extremities of the seed, and that part of it which is nearest the outside becomes the root of the future plant; while that which is toward the interior produces the stem and the head. The germ of corn generally begins, about twenty-four hours after it has been sown, to burst the coat of the grain, and to set itself at liberty. It pushes out its root, which is at first enveloped in a membrane; but this it soon bursts open. In a few days other roots shoot from the sides, each issuing from the case in which it was inclosed. On the fifth or sixth day the sprout begins to appear above the ground. In this state it remains a considerable time, till fine weather causes the ear to burst from the coats which had previously sheltered it from the variations of the weather and the inclemency of the seasons.

These considerations lead me to reflect on the nature of my life. My present state of existence may be regarded as the seed-time of a future life. We sow the seed; we only observe that it springs up; but mature fruits, the luxuriant ears, and the full sheaves, cannot yet be seen or reaped. We live in hope. The husbandman having sown his seed, leaves it to decay in the earth, abandons it to rain, storms, and sun-shine; and knows not yet how it will turn out. Such also is the case with regard to our spiritual seed. Let us not, then, be proud of what we sow, nor cast down if we do not immediately see the fruits. Let us never be weary of sowing to the spirit; for our good works, however small, may, perhaps, produce the most glorious fruits in life everlasting.

Now that the seed is committed to the earth, let us wait, without care or anxiety, for the period when we may reap the fruits of our labor; but whenever we behold our fields, let us, with every pious husbandman, humbly implore the Almighty to shower down his blessings upon the land.

OCTOBER 24.

OF THE PARTICULAR PROVIDENCE OF GOD.

It would be a great misfortune for the world and for us all, if there were any foundation for that principle of the incredulous, that God concerns himself only about the whole of his creation, or about whole species, genera, or classes, without deigning to notice the individuals of which they are composed. What a God would he be, were his nature such as the freethinker would persuade us! Or rather, would he deserve to be called God, if he would not or could not extend his care to all the parts comprehended in the vast whole! To me it is a consolation and a happiness that both Nature and religion teach me to believe the existence of a God, whose paternal providence watches over every, even the minutest individual.

Let it not be asserted that it is beneath the Creator to care for individuals. The whole system of the universe, like the smallest atom, is nothing in comparison of the infinite God. This being the case, what is it that we can call little and contemptible? How much smaller is the difference between me and whole nations, than between the latter and those prodigious orbs, which appear so in-

significant to uninstructed man! The most superficial observation will be sufficient to convince us, that in the eyes of that God, to whom a thousand years are as one day, and the universe is as a drop in the wide ocean, no creature can be so mean, no circumstance so insignificant, as to be unworthy of his attention. If we take the smallest plant, the most diminutive insect that we are able to dissect, we discover the most profound wisdom in the structure of the minutest vessels, as in the whole which they contribute to form; and the smallest part of these apparently insignificant objects tends no less to the perfection of the whole, than the animal or the plant itself to the perfection of the whole species, and the latter to that of the universe. If God has not disdained to form creatures that appear so contemptible, why should it be thought beneath him to preserve them? Or how can a whole species be preserved, unless that preservation be extended to individuals?

So far reason alone conducts me; but revelation strengthens my conviction. It informs me that all the hairs of my head are numbered. The meanest part of man, those hairs, thousands of which we lose in the course of our lives without missing them, or sustaining any inconvenience,—even those are numbered; and hence our Saviour drew this inference, that God must strongly interest himself in our welfare, and honor us with his peculiar attention. We know also that by the redemption of Christ, all mankind have been made acceptable in the sight of God. They are rendered still more precious in his eyes by becoming the brethren of his Son.

Of the particular providence of God

I worship thee, O eternal Providence, in Jesus Christ! Before the foundation of the world thou wast attentive to my happiness; before I felt the want of thy paternal care; before I could implore thee for it, or thank thee for thy beneficence. And can I be so infatuated as to suppose that thy care is not extended to me now? Thou hast even submitted to the most cruel sufferings for my sake, and shall I believe that the superintendence of my welfare is now too difficult a task? The ridicule of the atheist and the incredulity of the freethinker shall not shake my faith in thee. I will rely upon thy Providence, even though the infidel should strive to persuade me that I am forsaken by it. I know that my destination is not confined to this present world, but that in the life which is to come, the wonders of thy grace shall be manifested in me in all their glory. But, O my God, who am I that thou shouldst be mindful of me!—I, who am so sinful, so mean, so base—and thou, who art so holy, so pure, and so exalted! What, O Lord, is man that thou shouldst remember him, and the son of man that thou shouldst extend thy loving kindness to him! Let me, then, walk in the consciousness of thine omnipresence, and avoid every thing that is displeasing to thee. Strengthen my faith when it is shaken by the obscurity of thy ways, and let all thy dispensations terminate in my everlasting felicity!

OCTOBER 25.

OF THE DIVISION OF TIME.

TIME is measured and divided by the motions of the heavenly bodies, especially of the sun and moon. Those two luminaries have the most evident influence upon the state of man. The motion of the moon serves to mark the division of time on our globe only; whereas that of the sun doubtless serves for the same purpose in all the other planets that revolve round him.

The time in which the sun appears to make one revolution round the earth, or rather which the latter requires to revolve round its own axis, is called a day. That part of this time in which the sun is above the horizon, is employed by man in the performance of his principal occupations, and is called, by way of pre-eminence, day. The succeeding portion of this time, in which the sun is below the horizon, is denominated night. Day and night form together a civil, or solar day. A solar day is divided into twenty-four parts, called hours. Each hour is sub-divided into sixty equal parts, called minutes: each minute into sixty seconds; and each second into sixty thirds. This division of the day into hours, minutes, &c. is determined by the motion of the shadow of the index of a sun-dial, or of the hand of a watch or clock.

The dial, when well constructed, constantly marks the true time of the sun; but other time-pieces, all of which require to be regulated by the mean time of the sun, often need repair. In common life, most of the European nations begin the hours of the day at midnight, from which they reckon twelve

hours till noon, and twelve hours from that time till the ensuing midnight. The Italians, however, begin the day at sun-set, from which, till the same time the following evening, they count twenty-four hours. The Turks commence their day a quarter of an hour after sun-set; from which they reckon twelve equal hours, and when these are elapsed, they count as many more till the ensuing evening. The Jews begin the day at sun-set; from which time till sun-rise they reckon twelve equal hours, and the same number from the rising of the sun to his setting; consequently the hours of their day are longer or shorter than the hours of the night, whenever the day is longer or shorter than the night.

A week is the space of seven days. Some days of the week are called after the planets, which were formerly thought to govern those days; for instance, Sunday, from the sun; Monday, from the moon; Saturday, from Saturn. Others have received their appellations from the ancient deities of the northern nations; Odin, Thor, and Freya, having undoubtedly given their names to Wednesday, Thursday, and Friday. A solar month is the time that the sun takes to pass through one of the signs of the zodiac: but yet these months do not begin or end exactly at the entrance of the sun into a new sign. A lunar month is the interval between two new moons, that is, twenty-nine days, twelve hours, and forty-four minutes.

A solar year comprizes twelve months, or the time which the sun takes to pass through the whole ecliptic, which is commonly reckoned to be three hundred and sixty-five days, five hours, and forty minutes. These years are at present used by most of the nations of Europe. A lunar year is the space

comprehended in twelve lunar months, or three hundred and fifty-four days, eight hours, and forty-eight minutes. The Jews and the Turks employ this year; but to make it correspond with the solar year, the former frequently intercalate a whole month. Our common year commences ten or eleven days after the entrance of the sun into the sign of Capricorn.

These calculations and divisions of time, however trivial and unimportant in themselves, are nevertheless of great consequence when they are applied to the moral life of man. All the hours, days, weeks, months, and years which compose the period of our life upon earth, have been given us by God, that, by the proper use of our faculties, we might fulfil the end of our creation. The division of time affords us occasion for serious reflection on the manner in which we employ it. And how, then, do we act in regard to this precious time? In our eyes, minutes and seconds are trifles which are not worth our attention; though nothing is more certain than that he who makes light of minutes, will be equally prodigal of hours. Are we even more frugal of still longer periods? Let us calculate the number of days, which have been entirely lost for us, that is, for our immortal souls; how little will then remain for what may truly be called life! The result of this calculation will be, that he who is seventy years old, has lost more than fifty; and that a person of fifty can scarcely reckon up seven which he has employed in such a manner as to contribute to his everlasting felicity. O God of mercy! how distressing, how humiliating is this reflection! How many hundreds, nay, thousands of days and hours which thy paternal goodness has

granted me, to be devoted to my eternal interest, have I shamefully wasted, and spent in a total alienation from thee, the best and most tender of fathers! How many of them, O my God, have I passed in vanity, in idleness, and in the gratification of guilty passions! And with what inconceivable rapidity does the little time that is yet left me fly away! Before I am aware, an hour glides away, and is irrecoverably lost; and an hour is a considerable space for me who can so easily calculate by hours the period of my real life. Enter not into judgment with me, O Lord, on account of the days which I have so wantonly wasted. So teach me to number my days, that I may apply my heart unto wisdom; that in future I may make a proper use of that time which I have hitherto misspent, in assuring myself of thy favor through Christ Jesus, and the salvation of my immortal soul. It is only by thus accomplishing the objects of my destination, that I can enjoy a long and a happy life.

OCTOBER 26.

CONCLUSION OF SUMMER.

THE sun now feebly casts his rays on the earth; and the aspect of all Nature is changed. This earth, lately so beautiful and so fertile, is gradually becoming more dreary and impoverished. I shall no longer behold the brilliant enamel of the flowers, the charms of spring, the glowing magnificence of summer, those varied tints of verdure exhibited by the woods and meadows, the purple blush of the grape, and the golden hue of ripened harvests. The trees have lost their last ornaments;

Conclusion of summer.

the pine, the elm, and the oak bend beneath the blast of the tempest. The rays of the sun, without force and without heat, no longer penetrate the atmosphere and the earth. The exhausted soil has enriched us with its productions, and has nothing more to promise. This being the case, our pleasures must consequently diminish. When the earth has lost its beautiful verdure, its lively colors, its brilliancy, and, if I may be allowed the expression, its glory; when the landscape presents nothing but a swampy soil and gloomy hues, man loses those gratifications which are connected with the sense of sight. When the earth is stripped of the harvest, and the herbage which covers it, a rugged and uneven surface is exhibited to the view. It has no longer that smoothness, and that charming appearance which the corn, the herbs, and the grass imparted to the majestic hill and widely extended plain. The birds have ceased to delight our ears with their strains, and nothing now reminds man of those joys, which so lately he shared with other animated beings. He is deprived of the pleasure he derived from the melody of the feathered tribes, which has given place to the roaring of waters and the howling of winds, a monotonous, uninterrupted, and melancholy sound, productive only of disagreeable sensations. The fragrance of the fields is gone; and we perceive only a certain damp smell, which is not pleasing, unless it succeeds the sensation of heat. The sense of feeling is pained by the impression of the cold and humid atmosphere. Thus the fields no longer afford pleasure to any of the senses. The delicate nerves, of which they are composed, are strained in consequence of the disagreeable impressions they receive;

and afterwards become extremely relaxed, like all the muscles to which the feeble rays of the sun have ceased to impart activity.

But amid these gloomy prospects, I perceive how faithfully Nature fulfils the eternal law imposed upon her, that of utility at all times and in all seasons. Winter approaches; the flowers have disappeared; and even at such times when the sun diffuses his cheering rays, the earth appears divested of its former charms. But to the sensible mind, the desert fields still present the image of delight. Here grew corn, thinks such a person, raising his grateful eyes towards heaven. The gardens and the orchards are stripped and bare, but yet the reflection on the abundant stores we have received from them, inspires us with warm feelings of joy amid the chilling blasts of the north. The fruit-trees have lost their leaves; the grass of the meadows is withered; dark clouds discharge torrents of rain; the earth becomes soft and swampy, and walking is rendered impracticable. The thoughtless man murmurs at this change; but the reflecting mind contemplates it with emotion. Dry leaves and withered grass are prepared by the autumnal rains to form a manure to fertilize the earth. This consideration will certainly fill us with gratitude and joy for the paternal care of our Creator, and produce the sweetest hopes of the approaching spring. Amid the loss of all her external beauties and charms, nay, even while she is exposed to the murmurs of her children, whom she has nourished and delighted, our mother Earth is secretly employed in promoting their future welfare. Why then, I say, why does not the moral world fulfil its destination so faithfully as the physical? The fruit

of the oak never produced any thing but oaks; the vine never yielded any fruit but grapes; how is it then that a great man has children who bear no resemblance to himself? How comes it that the man of letters and the artist, who render such services to society, have sometimes ignorant and stupid descendants? How is it that virtuous parents give birth to a wicked progeny? When I reflect on this difference, I discover innumerable causes in the moral, as in the natural world, which occasion the best vine to produce grapes that are bad and sour, and respectable parents to have degenerate children. Proceeding a little farther with my meditations, I pause, and say to myself: Is not the prospect of my happy days likewise become overcast, and has not the brilliancy which surrounded me disappeared like dry leaves? Perhaps our condition here below has also its seasons. If so, I will make use of the fruits of my education and experience for my moral nourishment and recreation during the winter of my life; and, if the harvest be abundant, I will bestow as much as I can upon the poor, whose small, uncultivated field has produced but a scanty crop. Above all things, I am solicitous that when the summer of my life is past, I may come to an autumn rich in good fruits, honorable to myself, and useful to my fellow-creatures.

OCTOBER 27.

MAGNIFICENCE OF GOD IN THE WORKS OF THE CREATION.

God has manifested himself in the creation as a being infinitely wise. There is no creature, how-

ever useless it may appear to us short-sighted mortals, but what has been placed in it for some particular purpose; and each is formed in the manner best adapted to the end of its existence. This is incontestably true in respect to all those with whose destination we are acquainted; and numerous circumstances lead us to infer that the same is the case with regard to the rest. If we begin our investigation with the sun, and conclude with the most diminutive plant or insect, we shall be obliged to acknowledge that not one single object could have been formed otherwise than it is, to be adapted to the purpose for which the Creator designed it; and that its organization is so perfect as to be incapable of improvement. The minutest parts of every creature are evidently appropriated to its destination; they perform the functions prescribed by the Creator; and were a single one of these parts injured or taken away, the whole creature would be rendered imperfect, and even become, perhaps partially, or wholly unfit for the purpose of its existence. What a wonderful system results from the connection which all created objects have with one another! Each has its appointed place, and its peculiar functions, which are essential to the perfection of the whole. Were it to be taken away, what confusion would ensue! If we, then, represent to ourselves that Being, who has not only formed each individual of this innumerable multitude of objects, animate and inanimate, but who has likewise disposed and arranged all its parts to answer certain ends, so that nothing is wanting, and nothing superfluous; who, by the combination of all these individuals, has formed a whole, in which the most admirable harmony prevails, struck

with admiration and with reverential awe, we shall exclaim: "O the depth of the riches, both of the wisdom and knowledge of God!"

God has manifested himself in the creation as a being infinitely good. How innumerable are the animated creatures which his hand hath formed. Ever since the beginning of the world, man has studied to make himself acquainted with the living beings that are fellow inhabitants with him of the globe, and to this day he continues to discover new species which were before unknown. Is not life an invaluable blessing to all who enjoy it? Is it not dear, even to the meanest worm that crawls the ground? What delight must the Creator take in doing good, since he has bestowed on so many creatures the happiness of existence! But of what use would life be to the living, if it were no sooner given than taken away? The Creator has taken care that each shall live long enough to fulfil the end of its creation. He has assigned to each a situation in which it can find a sufficient subsistence; and every individual is supplied, immediately on its entrance into the world, with all that is necessary for the preservation of its life. Many animals bring with them into the world, the art of providing themselves with food; others, such as man, are dependent on their parents for their support. What inexhaustible fertility hath God imparted to the earth for the sake of man! How many millions of men and other animals has it nourished for near six thousand years! And though the world should endure six thousand more, there is no reason to doubt that it would continue to furnish an abundant subsistence to all the generations yet to come. With life, how many pleasures hath the Almighty conferred on his creatures, and especially on man!

Magnificence of God in the works of the creation.

With what magnificence hath the Creator fitted up the world which he is destined to inhabit; what social affections and what tender sentiments hath he implanted in his bosom? O my fellow-creatures, ye who alone are endued with reason, with the faculty of knowing the great author of your existence, be not ungrateful to so tender a benefactor! Acknowledge with joy, that the whole earth is full of the blessings of the Lord!

God has manifested himself in the creation as a being infinitely powerful. This omnipotence, which is displayed in every creature, is particularly striking in the largest and the most diminutive. What but an almighty hand could have reared the immeasurable fabric of the heavens; and what else could have preserved it uninjured and unimpaired by age to the present moment? Who but he could so firmly establish it, and yet maintain in it such a variety of wonderful motions? What else could have fixed the sun at such an elevation in the heavens, and commanded that luminary to remain in his allotted place, unsupported and unsuspended in the boundless expanse? Could any thing short of omnipotence have imparted motion to the earth, the moon, and the stars, and caused each to complete its revolution invariably in a certain period? Or would we rather consider the infinite power of the Creator in small things than in great, we shall find it equally incomprehensible. Let us examine the dust under our feet. This dust is inhabited by nations of insects, many thousands of which united would not be equal in bulk to a grain of sand. Each nevertheless has limbs, organs, and senses; each has its peculiar instincts, each is attached to life, and seeks to preserve it. Observe the grass in the fields, the hair of your heads, the

blossoms of the trees; study their structure and their origin. Throughout all Nature you will discover wonders, you will perceive the omnipotence of him who constructs the most magnificent spheres with the same ease that he causes a flower or a worm to be produced.

O Lord, how glorious and how innumerable are thy works! In wisdom hast thou made them all, and the earth teems with thy blessings. Teach me, my God, to be attentive to them, that I may become wise, and acknowledge that thou art the Lord, who hast created the heavens and the earth. Let these considerations excite me to love, to praise, and to confide in thee, the most amiable, the most exalted, and the most powerful of Beings!

OCTOBER 28.

LAW OF INERTION.

THE inertion of a body is nothing but the effort of that body to remain in its present state. If a body is at rest, it opposes motion, and strives to remain at rest. But if that body is once set in motion, it continues to move by virtue of the same law, and resists those bodies which would retard its progress, as forcibly as it before opposed the power which gave it motion. What wisdom hath the Creator manifested in this law! By means of it a regularity is produced in the motions of bodies, which enables us to investigate and to determine the rules of motion. If the heavenly bodies did not possess this power of inertion, they would not move with such order and regularity, and they would continually require a new impulse to keep them in motion:

and hence we may infer that the universe is the work of infinite wisdom. Take away but one single part of this prodigious fabric, and the whole will immediately be deranged. What advantage should we derive from the exquisite organization of animals and plants, or from the wonderful structure and arrangement of the celestial spheres, had not the wisdom of the Creator made them capable of those motions, to which, from their admirable construction, they are so perfectly adapted? How simple this law appears, and how astonishing are the effects resulting from it! Such, however, is the nature of all the works of the Lord. The principles are as simple as the edifice is grand. I cannot forbear regarding the universe as a magnificent palace. The thick and rugged walls on which the fabric reposes, appear to have neither beauty nor elegance: and yet they are so indispensably necessary, that without them the slightest breath of air would overturn the edifice. These rude foundation walls have nevertheless their beauty, but this every eye is not capable of discovering. None but an architect who is perfectly acquainted with the rules of his art, can enjoy the pleasure resulting from the contemplation of the symmetry, regularity, and perfection of this foundation. He alone perceives the reason why it is so deep, so broad, so thick, and so long; and why one method of construction has been employed in preference to another. At the same time that he is convinced of the perfections of the work, he has the satisfaction to know that he possesses sufficient skill and penetration to discover them. This is precisely the case with respect to the observation of all the works of God. Every spectator is not capable of fathoming the

fundamental laws on which a great portion of natural events depend, or of perceiving their utility. This knowledge is reserved for the philosopher, and affords him inexpressible delight.

There seems to be a certain degree of inertion inherent in the mind, which may, in some respects, be compared with the inertion of matter. Bodies that continually move in the same manner, and toward the same point, acquire a tendency to persist in that direction; and the mind has a similar propensity to actions which are frequently repeated. Hence the difficulty of relinquishing confirmed habits. We may, therefore, make an excellent use of this natural inertion of the mind, if we endeavor, by means of it, to keep in the paths of virtue. All that we have to do is to accustom ourselves to the performance of good and virtuous actions, as we had hitherto done to the practice of vice. As there is no lasting peace of mind without virtue, these efforts are so much the more necessary. But why do we so often stray from this path? Why do we pursue imaginary benefits, which ultimately lead us into perdition? Our hearts, subdued by the pride naturally inherent in them, and dazzled by the deceitful lustre of the objects of sense, causes us to approach the paths of virtue with reluctance. Let us not then be discouraged by the small degree of violence which we are obliged to do to our passions and inclinations! Even the most vicious are often obliged to restrain their passions, in order to obtain a temporal advantage, or to shun some particular evil. Under this constraint they experience all that mortification which the vicious cannot but feel when their brutal passions meet with obstacles and impediments. But, on the contrary, what

sweet emotions cheer the soul when the mind retains its control over the senses. A frequent exercise of this command at length places us in that happy and enviable state, in which the soul, elevated above the turbulent regions of the passions, looks down with pity on the low and contemptible herd of the slaves of vice.

OCTOBER 29.

WANTS OF MEN.

No creature on the face of the earth has so many wants as man. How naked, how forlorn, how ignorant he comes into the world! Nature has not endued us with that industry and instinct which most of the brute creation possess as soon as they are born: she has merely given us reason to assist us in the acquisition of many qualifications. In this respect the animals would appear to be objects of our envy. Are they not indeed fortunate in not wanting either the apparel, the arms, and the attendance which we require; in having no occasion to invent, learn, or practise the arts that are necessary for our accommodation? They bring with them into the world, clothing, weapons, and every other requisite; or, if they want any thing more, each species may easily procure it by an implicit obedience to the instincts implanted in it by Nature. If they want habitations, they know of themselves how to dig or to construct them. If they require beds, clothing, or a change of habits, they possess the art of spinning and weaving them, and of throwing off their former covering. If they have enemies, they are provided with the means

of defence; and if they are sick and wounded, they know where to find remedies. But we only, who are so superior to all other animals, have more wants, and fewer means of satisfying them.

It may, perhaps, be asked, why the Creator has in this respect made man so much inferior to brutes. It is certainly more rational to make this enquiry, than to murmur at the dispensation of the Almighty; for in this is manifested the adorable wisdom of God. In subjecting man to many wants, he wished to give continual exercise to his reason, which was conferred on him only for the purpose of making him happy. By our corporeal wants, and by the deficiency of our instincts, we are led to the use of our reason, and to the knowledge of ourselves and of the world, and are encouraged in persevering industry, if we would avoid poverty, pain, and vexation, and render ourselves agreeable and happy. The faculty of reason is at the same time the only means we possess of restraining our passions, and of preserving us from dangerous excesses. Of this truth a few examples will be sufficient to convince us. If we could procure the fruits of the earth without any exertion, a general and uninterrupted indolence would be the consequence. This way of life would enervate and paralyze all the nobler faculties of the mind. The bonds of society would be broken, our mutual dependence would be destroyed; for even children would have no occasion to apply to their parents, and much less to any others, for subsistence. All mankind would relapse into a rude, savage, and barbarous state; each individual, like the brutes, would live only for himself; there would be no subordination, no good offices, or mutual obligations. To our wants, there-

fore, we are indebted for the development of those faculties, to which we owe the prerogatives of humanity. They awaken the energies of our minds, they cause us to enjoy more conveniencies and more pleasures of sense than the animals are susceptible of. Our very necessities have rendered us sociable, rational, and moral, and have led us to the invention of many useful arts and sciences. Activity is upon the whole advantageous and necessary for man. If his powers are not exercised he becomes a burden to himself; he gradually sinks into a state of stupid ignorance; into indolence, gross sensuality, and other concomitant vices. Employment, on the contrary, gives an agreeable activity to the whole machine, and affords so much the more pleasure, the more art, industry, and intelligence it requires. Natural wants, therefore, were absolutely necessary to render us rational, wise, sociable, virtuous, and happy. If after having been nourished with our mother's milk, we had wanted no farther assistance or instruction, we might have lived independent, like the beasts; we should have had no occasion for language, or to make any use of our reason; consequently we should have been incapable of learning to know ourselves and other things, of acquiring any art or science, and of enjoying the noblest pleasures of the mind. Now, on the contrary, the helpless state of children induces the parents to take care of them out of love and compassion; while the children on their parts attach themselves to their parents, from the feeling of their wants, and the fear of danger, and by their instruction and example are accustomed to the use of their reason and a sense of propriety. They thus become good men, and useful members of society,

and they are enabled to lead a respectable and a happy life. Possessing these advantages, we may easily dispense with those which animals seem to have over us. We have no occasion either for hair or feathers for our clothing; we want neither teeth nor claws for our defence, neither senses more acute, nor any innate instinct, for our nourishment and preservation. By these gifts of Nature we should only be circumscribed within a more contracted sphere of animal perfections. Our senses, our understanding, and our manual exertions are sufficient to procure us clothing, food, and every necessary and convenience, preservation, and pleasure, and to enable us to turn to our advantage every object in the kingdom of Nature.

Thus those wants, on account of which some people murmur against Providence, are the real causes of our superior happiness, and the best means that the divine wisdom and goodness could have employed to direct the faculties of men in the manner most advantageous to themselves. If all were wise enough to employ them conformably with the views of their Creator, out of one hundred unhappy persons, there would scarcely be one that could ascribe his afflictions to fortune. We should then learn that the sum total of our distresses is far outweighed by that of the blessings which we enjoy; and that it depends only on ourselves to lead an agreeable, nay, even a happy life.

OCTOBER 30.

OF PRESENTIMENTS.

THE faculty of presaging future events, possessed by the soul, is manifested by effects so extraordinary, that they cannot fail to excite our astonishment. The images and sensations which produce a presentiment, are sometimes so obscure, and so closely concealed in the recesses of the soul, that we are not conscious of them ourselves. The soul, nevertheless, deduces from them very correct notions, and the image of the future is pourtrayed in the clearest manner. In this case it forms conjectures, without knowing what could have led it to them. It is astonished at the discovery, and takes them for inspirations. These supposed inspirations are what we call presentiments. They take place, when, without being able to assign the reasons on which our conclusions respecting any future event are founded, we, nevertheless, have an idea more or less distinct of that event. It should here be observed that presentiments are from their nature much weaker impressions than sensations. For this reason they cannot be correctly distinguished, as long as the senses and a heated imagination keep the soul in a violent agitation. But when the soul is at rest, presentiments appear most distinct; and hence silence, night, and sleep are the most fertile in these impressions. In such a state, man is often elevated above himself. He looks behind the curtain of futurity, without knowing how he has been enabled to do so, and announces what will come to pass, though he is scarcely enlightened enough to perceive what is passing before his eyes.

Of presentiments.

A multitude of facts leave scarcely any doubt that the soul possesses this faculty of forming presentiments: and those have made but very little progress in the study of Nature, who refuse credit to any thing merely because it appears extraordinary and inexplicable. This secret faculty, which sometimes apprizes us of future events, certainly exists in the soul; as is demonstrated by the numerous instances which occur in history, and all of which we cannot possibly deny. There are probably very few grown-up people who have not sometimes felt impressions of this kind. The soul possesses the faculty of recalling the past, as though it were present; why then should it not also be capable of foreseeing the future, not merely what must necessarily happen according to the nature of things, but what is fortuitous or accidental? For this purpose it may employ means similar to those which it makes use of in respect to the past. When it is acquainted with the history of past events, it can represent them to itself as present. Why then should we consider it impossible that our souls may receive information concerning the future. There are millions of spirits superior to man, who might reveal it to him; or the human mind may possess a faculty hitherto unknown, which may enable us to discover distant and future events.

But however obscure and incomprehensible the cause of presentiments may be, it is sufficient for me to know that they are capable of contributing more or less directly to my happiness. Sometimes they warn me of an impending calamity; at others they apprize me of some pleasing event that awaits me. Both contribute occasionally not a little to my felicity, I ought, however, to beware of convert-

ing this faculty of the soul into a torment; but, on the contrary, to make use of it to augment, as much as possible, my happiness and tranquillity. Above all, I should take care not to suffer myself to be led astray by superstition, and neither to place too much confidence in the impressions of which I have been treating, nor allow them to operate to the prejudice of those duties which I owe to my Maker.

OCTOBER 31.

THE POWER AND PROVIDENCE OF GOD.

GOD is the subject of my song. He is the God of strength; the Lord is his name: great are his works, and his empire extends beyond all the heavens.

He wills; he speaks, and worlds start into existence; he threatens, and the heavens and the earth are again reduced to nothing, from which they sprung.

Light is his garment; and all his dispensations are dictated by infinite wisdom. He governs the universe as God, and truth and righteousness are the foundation of his throne.

Lord of the universe, who is like unto thee! O Being who hast ever existed, and who wilt ever continue to exist; thou inexhaustible source of true felicity!

All that is, was, or ever shall be, in heaven, earth, or sea, is known to God; and the countless works of his almighty hand are ever present to his sight.

He encompasseth me; he watcheth over me; and under the shadow of his wings we can lie down

in safety. None of our actions escapes his penetrating eye, and he searches the inmost recesses of the heart.

He is always near us, whether we lie down, or whether we rise up. If we ascend into heaven, he is there; and if we take the wings of the morning, and dwell in the uttermost parts of the sea, even there shall his hand lead us, and his right hand bear us up.

He hears my prayers, and sees all that passes in my soul. All my good actions and all my faults are alike known to him, and he graciously hastens to support me under my afflictions.

Before I existed, he fixed my lot, and inscribed in his book the number of the days which he was pleased to assign me.

I possess nothing that I can call my own. Myself and all that is mine belong to the Lord my God. I will therefore give glory to his name, and his praise shall for ever dwell upon my lips!

Who can comprehend the magnificence of thy wonderful works! Every atom of dust which thou hast formed announces the power of its Creator.

The smallest blade of grass is a mirror that reflects his wisdom. The air and the sea, the hills, the vallies, and the plains proclaim his praises.

Thou waterest the earth, and clothest it with verdure. From thy hand we receive night and day, corn, wine, and every blessing.

Not a sparrow falls but by thy will, O Lord. Ought not then the assurance that thy hand is over me, to fill my heart with confidence and contentment?

If God is my protector and my deliverer, I have

nothing to fear either from heaven or earth, and even hell itself shall not be able to prevail against me!

NOVEMBER.

A HYMN OF PRAISE.

It is thou, O Lord, who hast created all the host of heaven, and the myriads of angels which surround thy throne. The immense expanse of the heavens, with all their magnificent decorations, is but the tabernacle of those blessed spirits that know and adore thee.

Thou hast adorned this globe with a thousand charms which delight our souls. That sun which irradiates so many worlds, which dispenses fertility to our fields, which enriches us with so many blessings, never deviates from the course which thou hast prescribed to him.

'Tis by thy command that the moon, the lamp and the ornament of night, sheds upon us her milder radiance. Which way soever we turn our eyes, or direct our steps, we discover proofs of thy bounty, and thy blessings never cease to visit us.

For us flow inexhaustible springs and fountains, to furnish us with limpid and salubrious waters. The beneficent dew vivifies and refreshes our meadows. The mountains and the valleys, the forests and the plains present to our view thousands of beauties; and the whole earth, which thy hand supports in infinite space, teems with blessings, is crowned with thy gifts, and fertilized by thy bounty.

We endure without murmuring the woes of life; they are always soothed by some enjoyments, and especially by the cheering influence of hope. The magnificent spectacle of Nature revives our drooping spirits, and the rays of thy grace dry up our tears.

But who can fathom the profundity of thy dispensations! In this life good and evil walk hand in hand. Earthquakes, lightning, tempests, the sea, war, pestilence, and diseases without number, frequently disturb the happiness of men; and the unrelenting hand of death spreads desolation over the whole surface of the globe.

A breath overwhelms us, hurls us into the tomb, and returns us to the dust from which we sprung. But blessed be God, who hath opened to us the doors of eternal life through Christ Jesus!

NOVEMBER 1.

OF MARINE ANIMALS.

At first sight we might almost imagine that there could not be any living creatures in the sea. What, and can there be animals which live, and have relations with each other, in the sea, which contains so many different species of plants, trees, and shrubs, which are so entwined, that it would appear impracticable to make a passage through this scene of wild confusion? Singular as this may appear at the first view, yet nothing can be more true. The sea contains not only a few individuals, but such a prodigious number of different species, that we are very far from knowing them all; much less can we enumerate the individuals belonging to each

Among this immense multitude there is no confusion, each species being perfectly distinguishable from the other: order prevails in the sea as in every portion of Nature. All the animals by which it is inhabited have their peculiar nature, food, instincts, way of life, and occupations. There, as upon the earth, each species borders closely upon others. Where one ceases, another begins. The stone which forms the highest link in the mineral kingdom is half a plant; the plant which terminates the vegetable kingdom is half an animal, and the highest in the brute creation bears a considerable resemblance to man. In the sea, also, Nature passes from the small to the great, advancing gradually in the scale of perfection, and unites all beings by one immense chain, in which not a single link is deficient.

How innumerable is the multitude of the inhabitants of the deep! What a variety, what a diversity in form, size, instincts, and destination! Some are so small that we can scarcely discern them; others so large that their prodigious bulk fills us with terror. Some are meanly clothed, and their color so nearly resembles that of the bottom of the sea, that it is difficult to distinguish them from it. Others are adorned by Nature with very brilliant hues. Some are not prolific, because otherwise they would destroy all the rest: others are so much the more numerous, being designed for the food of thousands of men and animals.

"O Lord, how manifold are thy works! In wisdom thou hast made them all, and the earth is full of thy riches. So is this great and wide sea, wherein are things creeping innumerable, both great and small beasts. There go the ships; there

is that leviathan, whom thou hast made to play therein. These wait all upon thee, that thou mayst give them their meat in due season." *Ps.* civ. 24—27.

NOVEMBER 2.

OF THE DIVINE WISDOM DISPLAYED IN THE CONNECTION OF THE DIFFERENT PARTS OF NATURE.

As all the members of our body form together one whole, arranged and constructed with great wisdom; so also the different species of natural productions may be regarded as members, out of which the Supreme Being has composed a perfect whole. A very small degree of attention will suffice to convince us, that every thing in Nature is linked together, so as to form but one immense chain. The different species of mineral earths evidently nourish and support the vegetable kingdom, without which animals could not exist. Fire, water, and air are indispensably necessary for the preservation of this terrestrial globe; consequently there is an indissoluble bond between all the various parts of Nature. Our globe, as philosophers demonstrate, has a necessary connection with the sun, and the other planets, nay, even with the whole system of the universe. To combine together such a prodigious multitude of different objects, required nothing short of infinite wisdom. This alone could unite so many millions of beings in such a manner that one should be subservient to the other.

If we would not lose ourselves in this immense ocean of the creation, we must confine our attention to the little system of our globe. The wisdom

which we there discover may enable us to form some idea of the intelligence manifested in the rest of the universe. Let us consider only what is immediately before our eyes. If we examine the animal kingdom relatively to the general system of Nature, and consider the wants that are common to all animals, we shall be struck with the harmony that prevails throughout. Warmth, air, water, light, are all indispensably necessary for their preservation; but it is not immaterial what proportion they receive of each. Too much or too little would be equally pernicious to them, and would reduce all Nature to the primitive confusion of chaos. A small increase of heat would prove fatal to all living creatures; for if the earth in general received more heat from the sun, the atmosphere in summer would of course be hotter in every country than it is at present. Now experience shews, that in many regions of the globe the heat is sometimes so intense, that were it to rise ever so little, or to continue for ever so short a time beyond what it actually does, men and animals would be destroyed, and the vegetable kingdom burned up. On the other hand, if we had less heat, we should not fare better, the cold being sometimes already so severe as to endanger the lives of animals, and, indeed, often to freeze them to death. The earth, therefore, stands exactly in that relation to the sun, the source of heat, which is alone adapted to all creatures, which, as we have seen, would be destroyed by any alteration. This just proportion Nature has also observed with respect to the air. The ascension of vapors is principally owing to the gravity of the air, and rain to its lightness. If the air were not so constituted, as to be sometimes more dense,

at others more rarefied, sometimes heavier, and at others lighter, we should not have that difference of temperature which is necessary for the growth of plants, and the preservation of animal life. If the air were universally heavier than it is, it would be more charged with vapors, clouds, and fogs; consequently its great humidity would render it unwholesome and prejudicial to plants and animals. If it were lighter, the vapors could not ascend and collect into clouds. Thus it is with every thing in Nature; in all, infinite wisdom has established a due medium. As all the elements are thus arranged in the manner best suited to the preservation of animals, so they also harmonize with every other part of Nature. The air was not formed merely to produce the necessary changes of the weather; it is at the same time the medium of sound. It must consequently have been adapted to our ear; and in this respect also it is formed with the most admirable wisdom; for had it been more or less elastic, heavier or lighter, the ear would suffer great inconvenience. The human voice, now so agreeable and melodious, would have resembled either the rolling of thunder, or the hissing of serpents. The air moreover contributes to the circulation of the blood. It penetrates into the smallest vessels. If it were more dense, its force would destroy every thing; if it were more subtle, its action would be too weak. A thousand other relations subsist between the air and the various parts of Nature; and it seems to have received for every one in particular that portion of its properties which is adapted to each, so admirable is the harmony that prevails throughout. If, then, we consider that many thousand species of animals and vegetables stand equally in need of

air, heat, and light; that each of these species differs from the rest, having its peculiar characteristics, and being weaker or stronger than others; and that, nevertheless, the elements are equally well-adapted to all, that they are adequate to the supply of so many and such multifarious wants, we are forced to acknowledge that a wisdom, for which nothing is too difficult, must have established that astonishing harmony and connection which subsist among so many different beings.

In a word, every thing in Nature is formed by number, weight, and measure, and destined for some important purpose. It is not only the tree towering majestically towards heaven; the nutritious herbage and the waving corn; the useful and laborious horse: the herds and flocks that supply us with food; the mineral kingdom, which yields us so many substances for ornament and for necessity; the sea, which so richly furnishes our tables, and bears us on its bosom from one region to another; the luminaries of heaven, whose influence the most ignorant cannot but perceive—it is not only these, I say, that occupy an important rank in the creation; but the humblest moss, the rudest shell-fish, the most diminutive insect contributes to the perfection of the whole.

Almighty Being, Creator and Preserver of all things, can I survey all these objects without thinking of thee, without admiring thy wisdom? Without the emanations of thy divine radiance, all Nature would be involved in dreary darkness and horrible confusion. Without thee the earth would be cheerless, and destitute of charms. Thy wisdom alone hath imparted to all Nature such beauty, perfection, and utility.

Yes, Lord, it is thy wisdom alone that embellishes, enriches, and preserves all things; that blesses and confers happiness on the animal creation. Thou shalt be the subject of my songs. I will bless and praise thee, O God, for to thee belong wisdom, power, and glory.

NOVEMBER 3.

REFLECTIONS ON A BED.

WHILE summer lasted, I have not, perhaps, valued the comforts of a bed so highly as they deserved: but now that the cold is daily encreasing, I am more sensible of the favor which God confers upon me, in permitting me to have a bed upon which to repose. If I were deprived, during these cold nights, of this accommodation, a due perspiration would not be kept up, my health would sustain injury, and my sleep would not be so sweet and so refreshing. In this point of view only, the bed is of considerable advantage to us. But whence proceeds the warmth which I there experience? It would be a mistake to suppose that it is the bed which warms me. So far from imparting warmth, it is from me that it must receive it. It only prevents the particles of heat emitted by my body from escaping into the air; retaining and concentrating them. When I reflect how many animals must have contributed to procure me a soft couch to repose on, I am the more thoroughly convinced of the value of this blessing. How many creatures must furnish their feathers and their hair for this purpose! Supposing that an ordinary bed contains only thirty-six pounds of feathers, as those of one

goose weigh no more than half a pound, it would take the feathers of seventy-two geese to form one single bed. How many hands, how many different materials, and what labor are required to make a complete bed! It is from these and similar calculations that we acquire a just sense of the favors which the Almighty has bestowed upon us. We commonly consider his gifts but very superficially; but if we would take the trouble to examine them in detail, we should be astonished at the variety of objects which concur in their composition. Analyze only in idea, my dear reader, the individual parts of which your bed is composed, and you will perceive with astonishment, that to prepare it for your use, it required the labor of at least ten persons; that it cost a great number of animals their lives; that the fields were obliged to furnish flax for the tick, and the forest to supply wood for the bed-stead. You will see that a considerable part of the creation was put in motion, that you might enjoy a comfortable repose. The consideration of the most common gifts which God has bestowed will lead you to the same reflection. Your linen, your clothes, your shoes, your bread, your drink, are all worthy of your attention, and teach you that none of them can be procured without the labor of a great number of hands, and the concurrence of many causes.

Is it, then, possible that you can retire to bed without feeling some emotions of gratitude! If, at going to rest, you had no other gifts for which to thank your benefactor, the comforts of your bed alone would deserve your grateful acknowledgments. What refreshment does it afford you after the fatigues of the day! In these cold nights,

apartments ever so well warmed would not do you so much good as a comfortable bed. Hot rooms warm the head more than the feet; but a bed, on the contrary, produces the most equal and temperate warmth. By its means you may procure, with the least expence, warmth, refreshment, and repose. If, then, it is unpardonable to sit down to table without returning thanks to the giver of all good, it is perhaps still more inexcusable to go to bed without expressing our gratitude to God. Let these considerations excite you to praise the Lord whenever you retire to rest, and to bear in mind the favor which God has conferred in giving you a bed upon which you can repose.

This it is so much the more your duty to do, as you will see but too many of your brethren, who either cannot find rest upon their beds, or even have no bed to lie down upon. These unfortunate mortals deserve your pity. Think how many are exposed to the open air, and to all the inclemencies of the weather, both by land and sea; how many, languishing in dreary dungeons, or inhabiting wretched huts, long for the comforts of a bed, and would think themselves the happiest of men if they had but one single part of the couch on which you repose. It is computed that the hundredth part of the inhabitants of a city are in these wretched circumstances. How much better do you fare than these children of misery! How many of your fellow-creatures watch every night for you, as the soldier at his post, and the mariner upon the ocean! How much more numerous is the class of those who, though they have beds, are nevertheless strangers to the sweets of repose. Within the small compass of a mile there are but too many

whom the pains of sickness rob of their rest; who are kept awake by the anguish of grief, the pangs of remorse, or the pressure of poverty and distress. What is your duty towards all these wretched sufferers? If you have not the means of soothing in one way or another the afflictions of your fellow men, give them, at least, your compassion and your prayers. As often as you retire to rest, pray for your unhappy brethren, who are deprived by so many different causes of the comforts of repose. Pray for those whose nights are rendered sleepless by grief, poverty, or pain; for those who are extended upon straw, or upon the bare stones; and then cast a look upon your bed of sickness and of death. There will come nights in which you will not sleep so soundly as you do at present. Floods of tears and the perspiration of death shall bedew your couch. A softer bed shall then receive you, and profounder slumbers seal your eyes. You shall repose undisturbed in the tomb, and shall awake again with new strength, to behold for ever the face of your God. In the days of health and prosperity, reflect on this bed which the earth shall provide for you, and let the thought fill your soul with happiness and joy.

NOVEMBER 4.

REFLECTIONS ON THE PAST SUMMER.

THE lovely days of summer are past, and except the sweet remembrance of their joys, they have left us nothing but emblems of the transitory nature of terrestrial things. How the whole face of Nature is changed! How cheerless the sun, peeping from

behind the gloomy clouds, sheds his feeble rays on the gardens, stripped of all their flowers, on the fields, where scarcely any traces of vegetation are to be seen, and on the hills, sprinkled with patches of dry and withered herbage. The air no longer resounds with the melodious accents of the feathered tribes; the silence is interrupted only by the harsh note of the crow, or the shrill cries of the birds of passage, steering their flight to more temperate climes. The neighboring hills are deserted; they are forsaken by the flocks, they are no longer animated by their bleating; and the beds of our gardens are laid waste. What a melancholy prospect is presented by the extended landscape! That beautiful verdure which so lately adorned it, is transformed into a dull and disagreeable yellow. The clouds discharge cold rains, and thick fogs veil the serenity of morning.

Such is the scenery which Nature now exhibits; and who can contemplate it without thinking of the frailty and uncertainty of all earthly things? The delightful days of summer have flown with rapid wing, and while we were preparing to enjoy them, they were gone with all their pleasures. But ought I to murmur at this, or to find fault with the dispensations of the Lord? O no; I will look back at the days of the past summer, and I will bless the Creator of all the seasons for the pleasures which I have tasted in them. With what sweet sensations, what pure delight has he often filled our souls, when we contemplated the charms of Nature, when we beheld the varied tints of verdure that decked the hills and the vallies, when we listened to the strains of the lark in the empurpled cloud, or the plaintive notes of the nightingale in the dark recesses of the

groves; when we inhaled the fragrant perfume of the flowers; when Aurora inspired all Nature with new life; or when the forests and the hills glowed with the rays of the sun! How many days have I passed in the enjoyment of the delights afforded by the beauties of Nature! Besides the pleasures of the senses and of the imagination, how many rich productions have the gardens, the fields, and the orchards yielded us! How can we think of the past months without feeling the sweetest emotions, without expressing our gratitude to the Father of Nature, who has crowned the year with his blessings?

We now live upon the gifts with which summer and autumn have presented us. In those seasons we observed the activity with which Nature cooperates in the views of her author for the benefit of man. How rich was the spring in buds and blossoms; what a multitude of fruits did the summer ripen, and autumn permit us to gather! The earth has for this year accomplished the purpose of its destination, and is preparing to enjoy a short interval of repose. Thus Nature is busily engaged for the greater part of the year, and even during her apparent cessation from labor, she is secretly employed in preparing for a new creation. But, let us ask ourselves, have we been equally active? Have we made such a good use of the past days as to have fruits to shew from them? As the husbandman now counts his sheaves, ought we not to have some virtuous actions, some good works to enumerate? Have the pleasures of summer made us better, and the beauties of Nature inspired our hearts with such emotions as to elevate them to God? Were our occupations during the long days of summer of such a nature as to promote the honor of

God, and the welfare of our fellow-creatures? Has the contemplation of the sun, the flowers, and other interesting objects, filled us with such sentiments as they ought naturally to excite? Can we assert that we may look back with pleasure at the use we have made of our time during the past summer?

We have still the happiness to live, and to be able to reflect on the spring and summer which are past; but since the commencement of the spring how many have been removed from the land of the living into the regions of death! It is just, O my God and my Creator, that I should praise thee for having prolonged my life to the present moment. But how soon will the period of my departure arrive! Perhaps I am not destined again to behold the beauties of summer. Should I be summoned before my judge, and required to give an account of the manner in which I have spent all the summer days of my life, what could I say but this: "O Lord, enter not into judgment with me!"

NOVEMBER 5.

INCONVENIENCIES OF NIGHT.

At this season the nights are continually lengthening. It is not to be denied that this arrangement is in some respects unpleasant: for though a portion of the night is allotted to sleep, and is destined to recruit and refresh weary nature, yet the very want of this refreshment, and the necessity of darkness to procure repose, are proofs of our weakness and frailty. At the approach of night all our labors are interrupted, not only from the want of the light, but also from the want of strength and spirits

necessary for prolonging them. It is, therefore, but natural that the hours of night should seem long and tedious, when wished-for sleep refuses to seal our waking eyes. With what impatience does the sick man count the hours, and long for the return of the morning's dawn!

One principal inconvenience of night, is, that we are liable when abroad to lose our way, and to meet with a variety of accidents. When the sun has withdrawn his light, and the sable mantle of night obscures the face of heaven, unable to perceive our way, we cannot keep in the right track, and are continually making false steps. Many a traveller, overtaken by the shades of night, wanders from the path into trackless desarts, amidst thorns and briars, into morasses, or falling into a pit, or down a precipice, suddenly plunges into eternity. In the night we are moreover exposed to the attacks of the villain and the depredations of the plunderer, whether at home or abroad. Darkness is an encouragement to the commission of many sorts of crimes, which are then concealed from the eyes of men. Hence the most atrocious deeds are perpetrated amid the obscurity of night.* Another disagreeable circumstance attending the night is the cold which then prevails; for when the sun has set, and we are deprived of his rays, one half of the globe is deprived of their genial warmth, as

* I am not displeased to find the author here correcting, or rather contradicting an assertion which he has made in a former part of his work, in his reflections for Sept. 23. At the time when I wrote my remark upon it, I had not read this passage, where the sentiments expressed so exactly correspond with my own. T.

well as of their light, and this occasions considerable inconvenience, especially in the nights of winter. To this we might add, that night, by its regular return, presents us every evening with a new image of death.

When light and darkness, night and day are compared together, we perceive their essential difference, and the real nature of each. It may be observed respecting things in general, that their true properties are not to be discovered but by a comparison with their opposites. The earth has neither continual day nor continual night; and though the intervals of obscurity are long in winter, and the return of darkness divides the days of summer, yet the God of Nature has favored our globe with a greater proportion of light than of darkness. This advantage we receive from the twilight, the moon, and the stars. Blessed be the Lord, for the light of the moon and of the stars, as well as for the rays of the sun and the splendors of noon. And thrice blessed be his name for the light of knowledge, holiness, and consolation, which he has diffused by means of his gospel through the night of error, ignorance, and misery. Some rays have descended from his celestial abode; they have penetrated the gloom in which we were involved, and illumined the dismal path we are obliged to pursue. Let us, O my friends, in our darkest nights, in the moments of our greatest sorrow and affliction here upon earth, remember that we are travelling toward the regions of light and joy. If it should sometimes happen that amid the darkness of night, the infirmities of our nature, or the woes incident to life, cause us to count the tedious and melancholy hours, let this be our consolation,

that we are not buried without hope in the obscurity of everlasting night; but that we are advancing toward that happy country where there is no night, no alternation of light and darkness, no sickness, sorrow, or distress.

'Blessed be God, that the night of ignorance and misery which here envelopes us in gloom, will not last for ever. Heaven and its glories await us. Hasten on, O sun, thou moon, and ye other radiant orbs of heaven—hasten to accomplish your prescribed course. Accelerate the alternate revolutions of light and darkness in this lower world, till all the months allotted to this my mortal life are terminated. By the light of faith I perceive the dawn of that glorious day, when the night and darkness which now encompass me shall be dispelled to return no more. Hasten, O delightful morning, hasten to crown my hopes. My soul longs to wing its flight to that blessed inheritance, to the mansions of bliss, where reigns eternal day, where no night, no weariness shall retard our progress to knowledge, holiness, and perfect felicity.

NOVEMBER 6.

OF WOODS AND FORESTS.

WOODS are justly reckoned among the most magnificent objects which the surface of the earth presents to our view. They appear at first sight to be irregularities, dreary solitudes, or at best, but wild beauties; but the attentive observer, who discovers beauty in all that is good, and instruction in all that is beautiful, finds in them many things that are worthy of attention. Now that your walks in

the fields and meadows have ceased to afford the pleasure which you found in them during the summer, the forests will be the more interesting: for no place is more proper to dispose our minds to meditate on the grandeur and beauty of the works of Nature, than a solitary wood, where the pleasing darkness and profound silence invite the soul to collect its scattered powers, and at the same time rouze and excite the imagination.

The great number of trees first attracts my attention. They are not so much distinguished by their height as by their port, their leaves, and their wood. The resinous pine is not remarkable for the beauty of its narrow, pointed leaves, but like those of the fir, they last long, and their verdure appears in winter like a relic of fairer seasons. The leaves of the linden, the ash, the beech, are more diversified. Nothing is more beautiful than their verdure, which refreshes and strengthens the sight. The broad dentated leaves of the one form a striking contrast with the smaller and more fibrous leaves of the other. We are as yet but imperfectly acquainted with the mode of their fructification, and the useful purposes to which their fruits might be applied.—How many different uses are made of the wood of trees! The oak-tree, which is longer than any other in attaining its full growth, and whose leaves do not make their appearance till all the other trees are clothed with foliage, furnishes the hardest wood, and art knows how to employ it in a great variety of works, which almost defy the power of time. Softer wood was equally necessary for other uses, and as its growth is quicker and more abundant, it serves for a greater variety of purposes. To the forests we are indebted for our houses and

our ships, for fuel, and a great variety of implements, utensils, and articles of furniture. The ingenuity of man carves it after a thousand models, and from the rude log produces an elegant and costly work.

The divine wisdom has distributed forests with more or less profusion over the face of the earth. Here trees appear only at distant intervals; there a verdant republic, many miles in extent, rises majestically into the air. The want of wood in one place is compensated by its abundance in others; and neither the continual use, nay, even waste which men are continually making of it, nor accidental conflagrations, have yet been able to exhaust this useful gift of Nature. An interval of twenty years shews us a wood, where in our infancy, perhaps, we saw nothing but a few straggling bushes.

May I not in this particular also discover the power and goodness of my heavenly Father? How infinitely superior is his wisdom to mine! Had I been consulted concerning the creation, I should probably have urged many objections to the production of forests. I should have preferred orchards and corn-fields: but the omniscient God foresaw all the wants of his creatures, with respect both to time and place. It is precisely in those countries where the cold is most intense, or where the greatest quantity of wood is required for navigation, that forests are most abundant. From the unequal distribution results a new branch of commerce, and a new bond of connection is formed among men. I participate myself in the benefits derived from forests; and in creating them God decreed the portion of advantage which I was to receive. Thanks

be to thee, most gracious Father, who hast vouchsafed to provide for us before we were sensible of our wants, and could represent them to thee. Thou hast anticipated all our necessities. May we endeavor to make the only return that we are able for so many benefits, to pay thee that tribute of gratitude which is so justly due. Every other necessary of life is to be procured only by labor. Corn is not raised without the sweat of the husbandman. The forests alone are produced without much human aid. They grow without any care of ours; they repair their losses by young shoots, and always afford us an abundant supply. To be convinced of this, we need only look at the seeds of the lime-tree, the maple, and the elm. From seeds so diminutive spring those prodigious trunks, whose summits seem to reach the very clouds. Thou alone, O Lord God omnipotent, preservest them for so many ages from the violence of tempests, and sendest dew and fertilizing rains to clothe them each succeeding year with new foliage, that they may enjoy a species of immortality.

The earth which produces forests would long since have been exhausted, had it been obliged to supply from its own resources, the losses it sustains by means of the foliage, blossoms, seed, and perspiration of trees; it is of itself but a heavy, dry, and sterile mass, which derives from other quarters the nutritious juices which it conveys to vegetable productions. Without our aid the atmosphere furnishes water, salts, heat, and all other matters in abundance; and to these we are indebted for the ncessant prosperity of forests.

O highly-favored man, raise thine eyes to that God who confers on thee so many blessings. The

forests and the woods are also heralds of his bounty. Thou wouldst be guilty of the basest ingratitude if thou didst not acknowledge this benefit, since there is scarcely any part of thy house but what brings it to thy recollection.

NOVEMBER 7.

OF THE SENSE OF FEELING.

It may justly be asserted, that feeling is the universal sense of animals; for without feeling there would be no seeing, smelling, hearing, or tasting. As the sense of feeling operates differently in sight from what it does in hearing, and in the latter from the impression which it makes on the other organs of sense, we may easily distinguish the sense of touch, properly so called, from the universal sensation that has just been mentioned. They are both produced through the medium of nerves. These nerves, of which anatomists enumerate ten principal pair, are a kind of small fibres or threads, which derive their origin from the brain, and are distributed over the whole body, even to the remotest extremities. Wherever there are nerves, there is also sensation: and wherever there is the seat of a sense, there also are nerves on which the impression is produced. There are optic nerves and auditory nerves, olfactory nerves and gustatory nerves, as well as nerves of feeling, which, as well as the sense of feeling itself, are distributed throughout the whole body. These last pass along the spine, whence they send out ramifications to every part. These nerves are likewise found in those parts which are the organs of the other senses,

to impart feeling to each of these organs, independent of its particular sensations. Thus the eyes, the ears, the nose, and the mouth, are susceptible of impressions dependent only on the sense of feeling, and totally unconnected with those produced by the nerves peculiar to those organs. That sensation is produced by means of the nerves, is evident from this circumstance; that the more nerves any member contains, the more acutely it feels, and that there is no feeling in those parts where there are no nerves, or where the nerves have been destroyed. Incisions may be made in the fat; the nails, the hair, and bones may be cut without inflicting any pain: or if any is supposed to be felt, it is merely the effect of the imagination. The bones are enveloped in a nervous membrane, and the nails are likewise attached to a part where many nerves meet. When any of these is hurt or irritated, then alone it is that we feel pain. Thus we cannot with strict propriety say that we have the tooth-ach; for the tooth, being a bone, is not susceptible of feeling, but the nerve in the middle of it, being highly sensible, causes us to feel the most acute pain when it is too strongly irritated.*

* The mechanism of the human body, the more minutely it is investigated, the greater admiration it will excite. What reader, without previous information, would have suspected the wonderful contrivance which the Creator has manifested in the structure of the tooth? Through a small hole in the root of every tooth we trace an artery to feed the bone, as well as a vein to bring back the spare blood from it; and yet both these, with the addition of the nerve that accompanies them, form a thread very little thicker than a horse-hair! T.

Of the sense of feeling.

Pause, reader, and admire the wisdom and goodness of your Creator! In distributing the sense of feeling through the whole body, he evidently designed to promote your happiness. The other senses are placed in those parts where they can most conveniently perform their functions, and be of the greatest utility to the rest of the body. As it is equally necessary for the existence and the welfare of the body that each part should possess feeling, and consequently have a perception of what is useful or prejudicial, agreeable or disagreeable, it is a wonderful providence of God that he has distributed the sense of feeling over every part of the body. It would therefore be extremely ungrateful, to be dissatisfied with the Creator for having bestowed on some species of animals a more acute sense of feeling than falls to the lot of man; especially when we reflect that this acuteness of feeling is necessary for their way of life, and as a compensation for the want of some other senses. It is, nevertheless, a circumstance worthy of our admiration, that animals and the insects in particular excel us in this respect. The horns of the snail, for instance, possess such exquisite sense of feeling, that the minutest obstacle which they encounter causes them to be drawn in; and how delicate must be the feeling of the spider, which, in the midst of her web, so ingeniously contrived, perceives the slightest vibration caused by the approach of any other insect!

Without dwelling, however, on the sense of feeling in insects, we find abundant subjects of admiration in the contemplation of ourselves. How can the nerves, which merely appear susceptible of

more or less thickness, length, consistence, tension, and vibration, transmit to the soul such a wonderful variety of perceptions as we find that they do? Is there such a connection between the soul and the organic machine to which it is united, that nerves of a determinate size, structure, and tension, always produce certain impressions? Are the nerves of each organ of sense constituted with such analogy to different particles of matter, that the impressions they receive from them are always productive of certain sensations? May the conical form of the papillæ of smell and taste be considered as a proof of the truth of this conjecture? To all questions of this kind we are obliged to cast our eyes upon the earth, and to acknowledge with humility, that these belong to those great mysteries of Nature which we are not permitted to discover.

What a debt of gratitude I owe to thee, my Creator, for having bestowed on me the sense of feeling! To what pleasures should I be a stranger, if my body had been endued with less sensibility! I should not have been impelled, either to take the precautions necessary for my preservation, or to avoid what might be prejudicial. O that my soul possessed a sensibility for probity and virtue as acute as that which my body has for pleasure! Thou didst once impress this moral sense in my soul; but how weak, nay, almost imperceptible it is become! I perceive but too clearly that I should be unhappy were it to continue thus gradually to decline. Deign to preserve me, O Lord, from such a misfortune!

NOVEMBER 8.

RECOLLECTION OF THE PLEASURES ENJOYED IN SPRING AND SUMMER.

COME, my friends, let us taste and see the goodness of the Creator! Let us call to mind with gratitude the joys of the days that are past, when reposing in the lap of pleasure, free from care and inquietude, the new-born world inspired us with emotions of ineffable delight: when devotion accompanied us to the verdant bowers, and the shadow of grief fled at our approach; when, hand in hand, we trod the flowery paths, seeking and every where discovering traces of our Creator; when the melodious strains of the feathered songsters concealed in the thick foliage of the groves, ravished our ears; when friendship and innocent mirth heightened our pleasures, and smiling Nature displayed a thousand beauties; while the rose, the carnation, and the gillyflower embalmed the air with their fragrant exhalations. Cool zephyr, with busy wing, wafted to us the odoriferous gale; our souls were thrilled with transport, and from our rosy bower, we stammered forth in concert with the aërial warblers, the praises of the eternal God.

Often when refreshing breezes had cooled the burning air of summer, and the choristers of the groves were animated with new life, when the clouds dispersing unveiled the serene azure of heaven, and the monarch of day promised us a continuance of his favor; pleasure lent us wings, and, hastening from the city and the "busy hum of men," we sought the verdant bowers, overarched by the hand of Nature herself. There, unmolested

by the intrusions of folly or impertinence—wisdom, piety, joy, the charming companions of innocence, attended us, while in the sequestered retreat, we contemplated the beauties of the creation. The foliage, waved by the breath of the sportive zephyrs, threw around us a refreshing shade. There Nature, from her abundant sources, poured upon us streams of rapture and content, enjoyed only by the pure heart. There, absorbed by admiration of the Creator and his works, and by the sense of our own felicity, tears of joy overflowed our eyes, and we gaily returned to our respective habitations.

The accents of joy that resounded through the forests, opened our hearts to pleasure, and inspired our souls with grateful emotions. The herds, having satisfied their hunger, bellowed forth their thanksgivings; the bleating of the nimble flocks, the artless notes of the shepherd's pipe, the buzzing of the beetle, "wheeling his drony flight" among the flowers, the hoarser croaking of the frogs, basking on the sunny bank; in a word, every thing filled us with rapture, and elevated our souls, step by step, to the Creator. We there traced the wisdom of the Most High, in the water and in the air, in the quadrupeds, in the insects, and in the perfumes of the flowers. A delicious landscape, beautiful as Eden, presented itself to our view. The distant hills and the venerable forests were gilded by the rays of the orb of day. The most enchanting mixture of numberless hues; the rich verdure of the carpet, woven by the hand of Nature, and enamelled with a thousand flowers; golden harvests; the luxuriance of the meadows; the nutritious food of the herds, so serviceable to man;—are not all these sufficient to excite a feel-

ing heart to bless the Creator, and to celebrate his goodness?

Here Nature, exposed in naked majesty, displayed to our view the greatness of her author. The meanest blade of grass appeared, equally with the most splendid flower, a master-piece of the wisdom and of the power of the Most High. Is this universe, thought we, constructed with such magnificence for man, who beholds its beauties with such indifference? For man the zephyrs waft refreshing breezes; for him murmurs the streamlet, when, at the hour of noon, he seeks repose from his labors; for him replenished ears wave in the breeze; for him the tree is borne down by its fruit; all creation is subservient to his pleasures and his wants; and yet he scarcely thinks it worthy of his notice.

As for us, O my friends, let us discover in the cooling breeze and in the purling brook, in the variegated fields and in the brilliant flowers, in the luxuriant grass and in the springing corn;—let us discover traces of the wisdom of the Eternal! Let every object in Nature be to us a herald of his power. That God who created the seraph, called every atom into existence; he is the maker alike of the elephant and of the mite. A blade of grass, as well as the aloe, fills an attentive mind with admiration of the Creator. Does not the muscle, as well as the whale, announce the grandeur of the Most High? Contemplate his works, and say, is not our God equally great in the insect imperceptible to the naked eye, and in the huge Behemoth; in the gentle zephyr, as in the most impetuous tempest; in the drop, as in the ocean; in the spark, as in the radiant spheres of heaven? The vast creation is his sanctuary; the earth is a temple consecrated

to his glory; man was appointed by him to be the priest of Nature, and not the tyrant and destroyer of his creatures.

NOVEMBER 9.

OF SOME FOREIGN ANIMALS.

EVERY division of the globe produces animals peculiar to itself, and it is for the wisest reasons that the Creator has placed them in one region rather than in another. Among the animals of the southern countries, the elephant and camel are particularly remarkable. They surpass in size all other land animals. The elephant appears like a living mountain, and his legs resemble pillars. His head is attached to a very short neck, and is armed with two tusks, by means of which he can, in case of necessity, tear up trees by the roots. A longer neck would not have been able to support the weight of the head, nor could the animal have raised it in an elevated position. To make amends for this, he has a very long trunk, which he uses like a hand to convey his food to his mouth, without the necessity of stooping. He can not only move it in every direction, and perform with it all that we do with our fingers, but he likewise uses it as the organ of smell. The eyes of the elephant are small in proportion to the rest of the body, but they are animated, sparkling, and very expressive. Even in a state of independence he is neither sanguinary nor ferocious, and never makes use of his weapons but in his own defence. Unless he is provoked, he never does any harm, but when irritated, he is truly formidable. He seizes his enemy with his trunk,

dashes him against the ground, and dispatches him by trampling him under his feet. The elephant eats daily one hundred pounds weight of grass, but from his bulk, he treads down ten times as much as he consumes in food. His principal enemy, and often his conqueror, is the rhinoceros, an animal which bears some resemblance to the hog. This beast, with the strong horn upon his snout, rips open the belly of the elephant, and thus gains the victory over his formidable antagonist. The slightest attention will be sufficient to convince us that the Creator has displayed his wisdom in the formation of the elephant. He has placed him in a country abounding in grass, and has taken care that he should not be burdensome to the earth by a too rapid multiplication. The female goes two years with young, and it is not till the third year that copulation again takes place.

The camel is one of the most useful animals in the east. It is most admirably formed by Providence to travel through scorching and sandy desarts, since it can live four or five days without drink, and requires very little food in proportion to its bulk. It crops the few shrubs that grow in these barren places; and when it meets with none of these, two quarts of beans and barley will suffice it for a whole day. This animal is not only remarkable for the hump upon its back, but it has also two gullets, one of which terminates in the stomach, and the other in a kind of bag, which serves as a reservoir for water. From this bag, when the animal is thirsty, it throws up into its mouth a portion of the water, which, having performed its office, passes with the food into the stomach. The ordinary load of a camel is from seven to eight hundred pounds; with

which it goes at the rate of about ten miles an hour, and travels twelve or fifteen hours in a day. The fleshy foot of the camel is well adapted to the scorching sands, which would burn a hoof like that of the horse, and render it wholly unserviceable.

Among the animals of the north, the elk, the sable, and the rein-deer deserve particular notice. The elk is large and strong. His head resembles that of a mule in form, size, and color. His legs are long and thick, and his coat of an ash color. This animal is stupid, simple, and timid. He finds food every where, but prefers the bark and the young shoots of the willow, the birch, and the service-tree. He possesses extraordinary agility; his long legs being admirably calculated for running away. The sable is a native of the forests of Siberia, and is in great request for its valuable fur. The chace of this animal is often the dreary occupation of the unfortunate wretches who are exiled to those desarts. The rein-deer, a handsome, lively animal resembling the stag, and seeking its own food, which consists of the buds of trees and moss, supplies the kitchen of the natives of the northern regions with flesh and milk, and draws them in sledges, with the greatest velocity, over ice and snow. These creatures constitute all their wealth; their skins furnish them apparel, beds, and tents; and the Laplanders, in particular, derive from them all the necessaries of life.

These particulars respecting a few of the most remarkable foreign animals, may give occasion for very important reflections. What a prodigious distance you discover from the elephant to the mite; and what astonishing diversity in the figure, conformation, organs of life, of the senses, of motion,

and of propagation! Nevertheless, every part of each animal is perfectly adapted to the way of life for which it is designed. As there are, in other parts of the world, animals whose existence requires a different climate, air, food, and temperature from what they would find in Europe; so we have no reason to doubt the existence of millions of other creatures, who could no more live in our globe than we could in Saturn or Mercury. Yes, O my Creator, the extent of thine empire is unlimited. It was thy object to produce as many different species of beings, susceptible of as many different kinds of happiness as possible. This plan, so worthy of thy bounty, thou hast executed with infinite power and wisdom. Blessed be thy name for this also, for ever and ever!

NOVEMBER 10.

DIVERSITY OF THE WINDS.

THERE is a great variation in the winds. In some places they are constant during the whole year; in others they change at certain periods, conformably with certain fixed and regular laws. In the great ocean, between the tropics, and for some degrees on either side of them, the wind is always easterly. To the north of the Line it blows from the north-east; and to the south of it from the south-east, and that more or less according to the position of the sun. This is to be understood only with respect to the open sea: for the islands and continents contiguous to the ocean produce considerable alterations, so that in some places it changes to north-east. In the southern part of the great ocean

Diversity of the winds.

a west wind commonly prevails. The nearer we approach to the coasts the more variable the wind becomes, and upon land it is still more unsettled. The regular east wind is chiefly caused by the heat which the sun communicates to our atmosphere. In the Indian Ocean we find another kind of winds, called monsoons, which, during one half of the year, blow from one quarter, and during the other half in the opposite direction. Their causes have not yet been accurately determined; but they are most probably owing to the variations of heat and cold, the position of the sun, the nature of the soil, and other circumstances of the like description. Some seas and countries have storms and calms peculiar to themselves. In Egypt and the Persian Gulph, a scorching wind often prevails in certain districts, burning up every thing in its course. At the Cape of Good Hope, a cloud, which at first appears extremely small, is sometimes seen rising above the horizon; suddenly increasing in size, a tremendous storm proceeds from it, and buries in the deep all the ships that are within the sphere of its operation.

Inconstant and variable winds prevail over the greatest part of the globe. Certain winds may blow more frequently at one place than at another; but yet they do not return at certain regular seasons. They vary as much as the numerous causes which derange the equilibrium of the air. Heat and cold, rain and sun-shine, mountains, and even bays and gulphs contribute greatly to check their course, and to give them a different direction. No doubt, many causes unknown to us tend to produce the frequent variations which take place in the atmosphere.

Diversity of the winds.

A circumstance which daily occurs almost every where a little before sun-rise, is worthy of notice. When the air, just about the break of day, is otherwise perfectly still and calm, a pretty brisk east wind springs up at the approach of the sun, and continues to blow for some time after his rising. This phenomenon is, in all probability, occasioned in the following manner: the air becoming rarefied by the rays of the rising sun, propels the contiguous air, and necessarily produces an east wind, which subsides in proportion as the atmosphere becomes more heated. For the same reason, an east wind ought not only always to precede the sun in the regions of the torrid zone, but it ought also to be much stronger than in our climates, because here the sun's power is much more moderate than in the vicinity of the equator. Accordingly we find an east wind continually prevailing in the tropical regions, where, on the contrary, a west wind is scarcely ever known to blow.

Thus you see, reader, that the winds are not the mere effect of chance, for which neither causes nor purposes can be assigned. Here, as in every other part of Nature, the Creator has manifested his wisdom and his bounty. He has arranged the winds in such a manner, that some one of them is almost always blowing, and a dead calm very seldom prevails. He regulates the motion, the strength, and the duration of winds, and prescribes the direction which they are to follow. By their variations themselves he confers important benefits. When the animals are languishing, and the vegetable creation drooping with long continued drought, the western ocean sends a wind surcharged with vapors to water the meadows, and to replenish the

streams. When this object is accomplished, a dry east wind drives back the other, and restores serenity to the face of heaven. The north wind brings with it a multitude of icy particles, and dispels all the noxious vapors of the autumnal air. Lastly, the keen north is succeeded by the kindly south wind, which, coming from the hot regions, diffuses a grateful warmth through the atmosphere. By this continual variation of the winds, fertility and health are preserved on the earth.

While I make these reflections, how can I forbear adoring thee, O Lord God omnipotent! All the elements are in thy hand, and thy all-powerful word either bids them rage, or appeases their fury. At thy command the tempest flies from ocean to ocean, from country to country, and at thy nod, all is again still. With what confidence may I commit my lot into thy hands! What! should I fear that thou who rulest the winds, couldst not also govern my destiny; that thou, by whose mandate all the variations of the winds contribute to the advantage of thy creatures, shouldst not be able to direct the vicissitudes of my fortune to the promotion of my real welfare?

NOVEMBER 11.

THE CHASE.

At this season hunting forms the principal amusement of a certain class of men. It were, however, to be wished that they did not attach so much importance to this gratification; for the dominion which man possesses over animals, and the pleasure which he takes in the exercise of his authority, are

too often attended with cruelty. Sometimes, indeed, the death of animals is necessary, that we may make the use of them for which they were designed; or when their numbers would otherwise become inconvenient or hurtful. But, even in these cases, it is our duty to render their death as easy as possible. Unfortunately, this duty, which Nature herself prescribes, is in general but little attended to in the chase. In this amusement man proves himself a tyrant, who is more ferocious than the most savage beast. How cruel, and, to every humane heart, how revolting are the means employed to take the innocent hare and the no less timid stag! Can it be called a manly pleasure to pursue a poor, defenceless animal with such inveteracy and such eager thirst of blood, till, exhausted with the anguish and fatigue of a long flight, it drops down, while its last agonizing convulsions are hailed by the shouts of the exulting huntsmen? Can that bosom lay claim to humanity which is not deeply affected at such a spectacle, or in which it excites not the slightest emotion of compassion? Too dearly bought is that pleasure which is purchased with the death of an innocent creature, or which tends to deprave the manners or the heart; for it is impossible that the heart of a man who is passionately attached to the pleasures of the chase, and who places in them a great portion of his happiness, can be alive to the soft pleasures of humanity, and not learn by degrees to take delight in scenes of blood and destruction. When man has habituated himself to cruelty towards animals, he soon stifles all sentiments of pity for his fellow-creatures. And besides, the chase appears to me to be an occupation that cannot be reconciled with our more im-

portant duties. Without taking into the account the loss of time, which is already too considerable, the chase diverts our thoughts too much from every other subject, and fills the imagination with ideas which are not compatible with serious avocations. Most assuredly, more tranquil amusements are better calculated to afford recreation to the mind, than those wild and boisterous pleasures, during which the soul is deprived of the power of reflection.

To a man who has any regard for morality and religion, the chase will always appear a very suspicious occupation. For ought we not always to be shy of an amusement, which leads so many into vices and irregularities? How often is health also impaired by the sudden heats and colds to which this violent exercise is liable! And then, what horrible oaths and execrations; what ill-treatment of horses, dogs, and men; what mischief done to the meadows and corn-fields! And can all these things be regarded as trifles unworthy of notice?

If we were wise, we should seek more pure and innocent pleasures, and of these we should never find any want. We need only look round us to discover pleasures in abundance on every side. The heavens, the whole earth, the fine arts, the sciences, labor, our senses, the converse with friends; in a word, almost every object we can think of may afford us subject for pleasure. Why then do we pursue coarse and boisterous amusements, or vicious gratifications, which always leave behind them disgust and remorse? We have within ourselves such an abundant source of pleasure, such manifold faculties, that if we were to endeavor to cultivate and improve them, we should receive fresh delight from every new accession or advance. But

in this consists the great art of the Christian philosopher, that he always knows how to amuse himself without much trouble or many preparations, without any great expence, and above all, without seeking vicious indulgences.

NOVEMBER 12.

OF DREAMS.

THE faculties of the soul are not entirely suspended during sleep. The imagination is often at work; and presents to us ideas and images as distinctly as real objects appear when we are awake. Such is our state in dreams. In these the soul is very little concerned, except as far as relates to the memory, which, however, must rather be ascribed to the animal than to the rational soul. If we reflect on dreams, and examine why they are so incoherent, and why the circumstances they represent are so extraordinary, we shall find, that it is because they proceed only from sensations, and not from ideas. We figure to ourselves persons whom we never saw; nay, even such as have been dead for many years. We behold them as if they were alive, we associate them with persons or things actually existing, or with those of former times. If the soul were active in dreams, it would require but a moment to reconcile these incongruities, and to arrange our confused sensations. On the contrary, it is in general passive, and suffers images to follow each other in the most incoherent manner; so that though all objects are most distinctly presented, yet their association is always confused and imperfect. Sensations succeed each other,

without being compared or combined by the soul. We have, therefore, sensations only, and not ideas; because ideas are nothing but comparisons of sensations. Thus dreams have their seat in the material sense, and are not produced by the soul; they consequently belong to animal recollection.

It is singular that the images which we see in dreams are perfect likenesses of the originals. It might be supposed that nothing but the soul of a painter could produce pictures so natural and so regular; and yet these designs, which are so extremely correct, are executed in dreams by every man, even though he may be ignorant of the first principles of drawing. He has, perhaps, often beheld the most exquisite landscapes, without paying particular attention to their beautiful scenery; and yet these unnoticed charms are more correctly delineated in dreams, than they could possibly be by the pencil of the ablest artist. But notwithstanding this correctness of representation, the succession of objects is without coherence and connection.

With respect to the accidental causes of dreams, by which old sensations are renewed without the aid of actual and present impressions, it is to be observed, that, in profound sleep we never dream, because the operation of all the faculties, internal and external, is then suspended. But the internal sense is the first that yields to the influence of sleep, and the first that awakes, because it is more animated, active, and easily excited than the other senses. Sleep is, at such times, more light and imperfect: and this is properly the season for dreams. Former sensations, particularly those upon which we have not reflected, are renewed; the in-

Of dreams.

ternal sense, which, from the suspension of the external senses, cannot employ itself with present, exercises itself on past impressions. It seizes in preference such as most forcibly affect it; and hence it is that dreams are, in general, either horribly frightful, or extremely agreeable.

Another circumstance relating to dreams is worthy of attention. Dreams are characteristic of the dispositions of man. From the nocturnal phantoms which engage his imagination, we may conclude whether he is virtuous or vicious. A hard-hearted man remains so in sleep, while the benevolent retain in their dreams the same philanthropic sentiments. Sometimes, it is true, a vicious dream may be occasioned by the state of the body, or by external or adventitious circumstances. Our conduct when we awake is the surest demonstration whether the impropriety of such dreams is to be ascribed to ourselves. The virtuous man is not indifferent with regard to his dreams; on the contrary, when he awakes, he is deeply afflicted, if only in his sleeping moments he has thought or done amiss. So much is certain, that the mind which falls asleep with impressions of the divine grace, is visited by images which may be called heavenly. A good conscience often consoles the righteous man in his sleep with the sweet sensations of the favor of his God.

But sleep is not the only time when extravagant and incoherent subjects produce confusion in our minds. How many are there who dream, even in their waking moments! Some are puffed up with ideas of their own importance, because the favor of the prince, or their wealth has obtained them distinction. Others build all their happiness on

All things concur in the preservation of created objects.

empty fame, and feast their imaginations with the vain hope of immortality. In the delirium of their passions and their hopes, they raise a fabric of felicity, but which is unsubstantial and perishable as a morning dream. The prophet has given us an admirable picture of these people. "It is as when a hungry man dreameth, and behold, he eateth; but he awaketh, and his soul is empty: or as when a thirsty man dreameth, and behold, he drinketh; but he awaketh, and behold, he is faint, and his soul hath appetite." (*Isa.* xxix. 8.) Let me, then, never seek happiness in vain phantoms and delusive dreams! Through thy grace, O my God, I will act more wisely. I will aspire only to solid and permanent goods, to such treasures and glory as shall endure for ever, and shall not embitter the awful moment of death with the anguish of remorse.

NOVEMBER 13.

CONCURRENCE OF ALL THINGS IN THE GENERAL PRESERVATION OF ALL CREATED OBJECTS.

ALL things which the all-bountiful Creator has produced on our earth, are admirably connected, and contribute to the mutual preservation of each other. The globe itself, with its rocks, its minerals, and fossils, owes to the elements its origin and continuance. The trees, plants, grasses, mosses, and every species of vegetable, are indebted to the earth for their support; while the animals derive their subsistence from the vegetable kingdom. All these are afterwards reduced to their original elements. The earth supplies the vegetable with its nutriment;

All things concur in the preservation of created objects.

the vegetable feeds the insect; the insect affords subsistence to the bird, and the bird to the wild beast. The wild beasts are preyed upon by the vulture; the vulture is consumed by the insect; the insect nourishes the plant, and the plant the earth. Man himself, who converts all these things to his own advantage, frequently becomes the prey of the wild beast, the rapacious bird, the insect, and the earth. Such is the circle in which all created things are perpetually revolving.

Thus Nature hath made all things for their reciprocal benefit, but none of them solely for itself. The tiger, the lynx, the bear, the ermine, the fox, yield their furs for the use of others. The dog pursues the hare, and hunts down the stag in the forests to supply our tables; while he himself receives but a small portion for his services. The ferret drives the rabbit from its deepest burrows for the advantage of man. The horse, the elephant, and the camel are trained to carry burdens, and the ox to draw the plough. The cow gives milk, the sheep furnishes wool, the rein-deer bounds with the sledge over snow and ice; the swine, the hedgehog, and the mole burrow in the earth, and turn it up, to render it fitter for the propagation of the seeds of herbs and plants. The falcon is rendered subservient to the pleasures of the chace, and the hen lays eggs. The shrill cry of the cock wakens us in the morning, and the carols of the blithesome lark delight us in the day. In the morning and evening our ears are regaled with the melody of the blackbird; and the varied notes of the nightingale beguile the hours of night. The eye is charmed with the brilliant plumage of the peacock. The fishes, quitting the abysses of ocean, are obliged, at stated

All things concur in the preservation of created objects.

seasons, to repair to our coasts and to ascend the rivers, that they may afford an abundant supply of food to men, birds, and beasts. The silk-worm spins, that we may be clothed with its precious web; and for our use the bees collect honey, so delicious to our palate. The sea daily casts upon our shores multitudes of shell-fish, for the benefit of men and animals. The lantern-fly of Surinam shines during the night, to give light to the inhabitants of that country.

If we examine the different occupations of men, we shall perceive that they equally tend to the same object which Nature has proposed. The mariner exposes his valuable life to the tempests, and all the perils of ocean, to convey to his native land the produce of other regions. The soldier sheds his blood for his country, and the welfare of his fellow-citizens. Those who preside over the administration of justice are wholly occupied with the affairs of others. Sovereigns devote their time and their faculties to the good of the state. Parents amass property for their children. The husbandman sows and reaps, but himself consumes a very small portion of the produce. Thus we do not live for ourselves alone; for the wise author of Nature has so ordered it, that all created things shall be useful to one another. Hence we may learn what are our reciprocal duties. The strong is designed to succour the weak; the wise to give good advice to the ignorant; the man of learning to instruct the illiterate, and each of us to love his neighbour as himself: and by so doing we accomplish the gracious purposes of the Creator. These reciprocal duties, which we owe to one another, caused men to form societies for the general benefit; for that which in-

All things concur in the preservation of created objects.

dividual exertion could not effect, is easily executed by the united efforts of many. Who could erect a spacious edifice, or build a magnificent palace, if he set about, unassisted, to lay the foundation, to dig the cellars, to make the bricks, to construct the walls, to raise the roof, to finish the interior of the apartments, and to do every thing else that is necessary for the completion of the work. But all this is easily performed by the joint labors of numerous hands. Accordingly we find that, throughout all Nature, and in all the arts and sciences, nothing great or excellent can be effected without the concurrence of many. How many thousands of men are requisite to make a monarch powerful, a kingdom prosperous, and a people renowned.

In all this, O my Creator, I discover proofs of thy wisdom. To promote the happiness of the inhabitants of this globe, and particularly of highly favored man, thou hast established such relations between all created objects, that one cannot subsist without the other. Experience daily convinces me how solicitous thou art to further the welfare of mankind. To this end the whole world is constituted and arranged; and all its parts contribute to the pleasure and convenience of mankind. The most trifling things, which we deem scarcely worthy of our notice, may perhaps have a powerful influence upon our happiness. How many insects, for instance, that appear so contemptible, are of the highest utility to man! How many thousands of hands are daily employed for my benefit, and how many animals are yearly slaughtered to supply me with food! And in how many ways, of which I am ignorant, is Nature employed for my advantage! Gracious Father, teach me duly to

appreciate thy goodness and my felicity: and excite in my heart the desire of doing for thy honor and glory whatever my limited strength and faculties will permit.

NOVEMBER 14.

COMMON SALT.

The seasoning of the rich and the poor, indispensably necessary alike for the king and the beggar, is salt. Its taste is so grateful, and it possesses such excellent properties for digestion, that it may be regarded as one of the most valuable gifts which Nature has bestowed upon man. She supplies us with salt in different ways. The inhabitants of the coasts procure it from the sea. They dig pits on the shore, which they plaster internally with clay; these are filled by the sea when it is agitated, and the water left behind being evaporated by the heat of the sun, a considerable quantity of salt is found at the bottom. In other places Nature has given salt-springs, from which the salt is obtained by evaporating the water by means of fire. In other places again, salt is found in solid masses in the mountains; the most celebrated mines are those of Catalonia and Poland. All these different kinds of salt are alike in their principal properties. Expérience teaches us that salt, dissolved in the stomach and intestines, has a digestive power, and that it likewise prevents the putrefaction and too great fermentation of the alimentary matters. Hence it is used internally to promote digestion, to excite appetite, and to stimulate the stomach, the nerves of which it gently irritates, and thus promotes all

its operations. At the same time it draws to the intestines various juices, which not only attenuate the lymph, but likewise facilitate evacuation. All these virtues denote an excellent digestive, whose operation is nevertheless so mild, that it can scarcely be called a medicine, because it has no effect, unless when taken in considerable quantity; so that there is no occasion to be anxiously precise in the proportion of it which we use in our different kinds of food. Such another digestive as common salt is not to be found in all Nature; for all other salts either act too powerfully, or are too disagreeable to the palate to be mixed, like it, with food of any kind. Common salt, on the contrary, operates very gently, corrects the vices of digestion, and prevents the putridity to which many sorts of food are disposed.

Salt is therefore a particular blessing, for which we are not sufficiently thankful, though we enjoy it every day. I wish, reader, to direct your attention to this subject, and, if possible, to excite your gratitude to your benevolent Creator for this benefit. If you would give greater heed to the daily blessings of the Lord, what frequent occasions you would have to acknowledge and admire his goodness. Endeavor to make this a subject of reflection during your meals, and thus henceforth sanctify the use of food. It is obvious that the greater number of aliments would lose that taste which gratifies the palate, and become insipid, if you were deprived of salt; and this is the least of the advantages which you receive from it. The preservation of your health ought also to stimulate you to pay your acknowledgments for this blessing. How should I rejoice, could I excite you, by these reflections, to

prize this benefit of the Almighty more highly than you have hitherto done. Your hearts would thus be more and more confirmed in what is good, and you would accustom yourself to the contemplation and admiration of the works of God.

Salt is farther interesting to an observer of the works of Nature. The smallest particles of common salt seem to have eight angles and six sides, like a die; hence most of the larger pieces approach a square or cubical form. In this also may be discovered the hand of omnipotence, which has caused all kinds of salt to assume, in crystallization, a particular figure. This invariable uniformity is the most striking demonstration that they do not owe their origin to chance, or to the mere motion of matter, but to the will of an intelligent Being. This reflection is so important and so necessary for our peace of mind, that we ought to neglect no opportunity to renewing and impressing it more and more upon our hearts.

NOVEMBER 15.

ORIGIN OF SPRINGS.

ALL great rivers are formed by the union of smaller streams; these owe their origin to brooks, and brooks take their rise from springs. This is apparent to every observer. But whence do springs proceed? Water, from its gravity as well as its fluidity, always occupies the lowest situations on the surface of the earth. Whence, then, comes the water which is continually pouring from the most elevated regions?

Origin of springs.

It is certain that rain, snow, and in general all the exhalations which fall from the air, supply a great portion of the water which flows from springs. Hence it is that springs and rivers are so rare in the desarts of Arabia, and in certain parts of Africa, where it never rains. These waters penetrate the earth till they come to beds of clay, which obstruct their passage. Hence they accumulate, and form springs, or first collect in cavities, which afterwards overflow. The stream which thus escapes by subterraneous channels, is joined by a greater or less number of others, and at length bursts from the bosom of the earth. It is, however, nearly certain that the waters which fall from the atmosphere are not the only cause of springs, at least in in some countries; for there are upon high mountains considerable springs and standing waters, which could scarcely have been produced altogether by rain and snow. Many springs yield the same quantity of water at all seasons; nay, there are some which supply a larger quantity during long continued drought than in wet weather. Other causes must, therefore, doubtless contribute to the formation of springs.

Many springs proceed from vapors, which are partly driven by the winds against the mountains and elevated situations, and are partly drawn by means of the power of attraction toward these prodigious bodies. The atmosphere is more or less charged with aqueous exhalations, which, being impelled against the cold and solid rocks, are condensed into drops, and thus increase the springs. All springs, however, cannot be thus supplied. In this case, would not the Danube, the Rhine, and

other large rivers which rise in high mountains, be dried up, when these mountains are covered with ice and snow? It is possible that subterraneous caverns, which have a communication with the sea, or with certain lakes, may contribute to the origin of springs. The vapors of the sea, rising through the crevices and apertures of the caverns, are condensed into drops, and often run off by very different channels from those by which they came; for water cannot always make its way where vapors penetrate. Lastly, it is possible that the sea-water, especially in the countries bordering upon the ocean, may filtre through the earth. and produce some springs; and such have generally a taste resembling that of the waters from which they originate. It is certain, however, that the springs on high mountains cannot proceed from such a cause, as the sea-water cannot ascend so high, and even if it could, it would not be converted into water that is perfectly fresh.

We know for certain that Nature employs all the means that have been enumerated to produce springs. To this end, several of them in general co-operate, and perhaps various others, with which we are unacquainted, may likewise contribute their aid. Nature, indeed, is always simple in her operations; but this simplicity is not inconsistent with the employment of more than one cause for the production of each particular effect; it is manifested, on the contrary, in this, that all the effects which are necessary in her economy, are produced by as few causes as possible, though a number of auxiliary causes always concur in one general effect.

If, however, the origin of springs were still more obscure and doubtful than it is, we should yet be

ultimately obliged to resort to God as the creator and preserver of them. He speaks, and springs burst from the bosom of the mountains; they swell to streams, brooks, and majestic rivers. From them the inhabitants of the fields receive refreshment, and with their limpid waters they allay their thirst. Rills also glide through the forests to give joy and gladness to the wild tenants of their dark recesses. It is God, then, who causes springs to flow from mountains and elevated places; it is he who directs their currents towards the vallies, augmented in their course by tributary streams, or by vapors. By this wise arrangement God preserves in the kingdom of Nature that continual circulation of waters, which contributes greatly to the fertility of the earth, and to the salubrity of our habitations.

NOVEMBER 16.

OF HUMAN HAIR.

I INVITE you, reader, to examine with me the hair which covers various parts of your body. If you reflect on its curious structure and various uses, you will not regard it as an object unworthy of notice, but you will discover in it traces of the omnipotence and wisdom of your Creator.

In each entire hair we perceive with the naked eye a long, slender filament, which is generally thicker, and always more transparent at the extremity, which is called the root. The larger hairs on the head and other parts of the body have their whole root, and part of the filament, inclosed in capsule, or sheath. This sheath is composed of

fine membrane, that is capable of extension. Its size differs according to that of the root, being always considerably larger than the latter, that it may not be too much confined, and that some space may be left between it and the sheath. The root of the hair consists of two parts; the one external, and the other internal. The external is a pellicle composed of numerous laminæ; the internal is a gelatinous fluid, in which several fibres are united. Both these substances form the marrow of the root. From the upper and lower part of the exterior of the root, proceed five, and sometimes, though rarely, six threads, which are very fine, white, transparent, strong, and often twice the length of the root. Besides these threads, many small knots are seen attached in different places; they are of a viscous nature, and easily dissolved by heat. From the internal part of the root issues the body of the hair, in the structure of which may be observed three different parts, the exterior case, the interior tube, and the marrow.

Where the hair is connected with the root, it is firmly surrounded with the membrane of the latter, which here forms a very small tube. In this tube it is at first completely enveloped, and in its farther progress penetrates either through the skin, or a nervous papilla, or the epidermis. With the epidermis it forms a capsule, which serves to protect the young hair, which is very soft. The rest of the case of the whole hair has a peculiar kind of transparency, especially at the point. In a young hair this case is soft, but in an old one so hard that it springs back with a noise when it is cut. This exterior coat preserves the hair a long time uninjured. Immediately under this coat or case, some

very delicate tubes run throughout the whole length of the hair. These tubes are joined together, and attached to the case which surrounds them all, by means of numerous elastic fibres; and thus united, they form a channel through the middle of the hair. Their cavities are not empty, but contain two substances, the one fluid, the other solid, which together form the marrow of the hair.

An attentive observer of the works of God will discover the divine wisdom as clearly displayed in the structure of a hair, as in the formation of the other parts of the human body. From the sole of the foot to the crown of the head, there is no part but what manifests traces of the divine intelligence. Even those parts that apparently are the most insignificant, and might easily be dispensed with, seem important when we consider their relations with the other members of the body, or their curious structure, or their destination. This is particularly the case with our hair. How few are there that regard their hair as an object worthy of their attention; how few take the trouble to discover in it the wisdom and goodness of God! What, it may be asked, is it possible to discover proofs of the divine wisdom and beneficence in our hair? Certainly it is: for there is no part of our body that is superfluous, or that has not been formed for some useful end. It is obvious, in the first place, that the hair of the head contributes very much to the beauty of the face; and this is perhaps the least advantage. Does it not serve to cover the head, to protect it from cold and from injury? Is it not designed to promote the insensible evacuation of humors which may be collected in the head, and the other nobler parts of the body? And how many

other useful purposes which the hair is designed to answer, may have hitherto escaped the most skilful anatomist of the human frame! Let us be content to discover only some of the designs of our Creator, especially as these are abundantly sufficient to manifest the power, the wisdom, and the beneficence of the Most High.

NOVEMBER 17.

SYSTEM OF THE UNIVERSE.

HITHERTO, reader, your attention has been occupied with the earth, this diminutive point in comparison of the universe. Now soar aloft to those orbs, at the sight of which, this globe on which you dwell, with some millions of human beings, shall vanish into nought. Contemplate, meditate, admire, and adore!

The all-enlivening sun is nearly in the centre of the universe; and without changing his place, turns round on his axis from west to east in twenty-seven days and twelve hours. Around him, in elliptical orbits, revolve all the planets, from Mercury to the Georgium Sidus. And are these the limits of the universe? By no means: the fixed stars are placed at a prodigious distance beyond the remotest planet. The nearest of those stars is calculated to be at least twenty-seven thousand four hundred times farther from the earth than the sun, whose greatest distance from us is twenty-two thousand semi-diameters of the earth. And how many globes, which our limited faculties will not permit us to discover, may there not be in the vast space between the planets and the fixed stars!

But how can that be? some of my readers may

perhaps ask. The sun, which, if we may believe our eyes, daily travels across our hemisphere, cannot stand still! Is he not in the morning in the east, and in the evening in the west? And then again, how can the earth continually revolve round the sun without our feeling its motion? These objections, founded only on the illusion of our senses, are of no importance. When we are gliding over the smooth bosom of the deep, or even when we are riding in a coach, does it appear to us as if the ship or the vehicle advanced? On the contrary, all the objects around us seem to recede, though, in fact, they remain motionless. We are, moreover, so accustomed to the motion of the earth, that, if it were possible to transport ourselves to a place which did not turn round, we should feel extremely awkward. How contradictory soever it may appear to our senses, reason is compelled to acknowledge the truth and the wisdom of the system of the universe. In all her works Nature pursues the easiest, the shortest, and the simplest way. By the mere revolution of the earth round the sun, we are enabled to determine, in the most precise manner, the monthly and yearly motions of the planets, notwithstanding they appear to be immoveably fixed in the heavens. And is it not more natural and more easy for the earth to turn round its axis in twenty-four hours, than for such prodigious bodies as the sun and the planets to revolve round our globe in the same space of time? An incontestable proof that the sun, and not the earth, is the centre of the universe, is afforded by the motions and distances of the planets, which are not in relation to the earth, but to the sun. If, however, we adopt the contrary hypothesis, where then would be the harmony which exists among all the

works of the Creator? But, according to our system, each of the heavenly bodies has the same kind of motion as we ascribe to the earth.

The contemplation of this magnificent system of the universe is admirbly calculated to inspire us with the most lofty deas of our adorable Creator, and to excite in us a lively sense of our own insignificance. With what rapture our souls pass from one idea to the other, and are lost in silent meditation on the greatness of the Most High! The limits of the human understanding will not, it is true, permit us in our present state to acquire a perfect knowledge of the system of the universe. So much, however, we can perceive, that the whole is arranged with infinite wisdom and goodness, and that a system more replete with skill, harmony, and convenience for its inhabitants, could not possibly have been devised.

NOVEMBER 18.

OF LOBSTERS.

If this species of animals did not serve us for food, still they would be worthy of notice. A little before this period of the year, the females undergo a great change. They cast their old coats, and acquire new shells. In thus changing their covering, they likewise increase in size. This manner of growing is common to all crustaceous animals, which experience some pain in disengaging themselves from their old shells. At the same time a great change also takes place with their stomach, which is detached, together with the intestines, from the body. The old stomach wastes away by

degrees, and during the moulting season the animal even appears to subsist upon those parts of his body which were before subservient to digestion. The small, white, round stones, improperly called crabs' eyes, begin to be formed when the old stomach is decaying; they are afterwards enveloped in the new one, in which they gradually diminish, till at length they completely disappear. Perhaps the lobster may make use of them as a medicine during the extraordinary change which it undergoes.

Except at the time when they cast their shells, these animals, which are furnished with eight legs, keep at the bottom of the water, at some distance from the shore. In winter they remove into deeper water; but in summer they approach nearer to the shore, unless the want of food compels them to go farther out into the sea. To enable them to seize their food with greater facility, Nature has given them eight legs, or eight pincers, the largest of which are sometimes almost as large as the head and trunk together. A most singular property which they possess, is that of re-producing their horns and claws when they are broken; nay, they often cast them away of themselves, when they are inconvenient. This operation they can perform in any posture; but it is effected with the most ease when they lie upon their backs, and the shell is broken, and the flesh pressed out with strong iron pincers at the third or fourth joint. Immediately after the mutilation, the wound begins to bleed, and the animal shakes the limb with pain. Soon afterwards the wounded part suddenly detaches itself at the second joint from the body. The fracture always takes place at the softest part of the joint; the small cir-

cumference of the latter, together with the position of the fibres, and a certain, small, circular cavity, probably continue not a little to favor this operation. As soon as the claw is broken, a gelatinous substance oozes from it, and staunches the blood; but if this were taken away, the animal would bleed to death. This substance is gradually transformed into a new leg, which is at first small, but in time acquires its due size, and replaces the former.

The manner in which these animals propagate their species is not less singular. The male carries the prolific matter in a thread of extraordinary length. He is distinguished by two spikes opposite each other, under the tail, while the female is quite smooth in that part. They copulate in autumn; and if at that time a female lobster is opened, you find large red clots, which are the evidences of impregnation. These clots gradually diminish internally; and under the tail, where the female has numerous small fibres, small round eggs, resembling hemp-seed, begin to make their appearance. The first eggs are perceptible in December, and from that time they continue increasing in number till they amount to more than one hundred. As the warm weather advances, they grow larger; and before midsummer, small live lobsters are found among the eggs, which remain attached to the fibres under the mother's tail, and are there fostered till all the eggs are hatched. They then disengage themselves from the fibres, and clinging to those of the roots of trees and plants which grow on the shores, remain entangled among them till they are sufficiently large and strong to commit themselves to the waves.

Advantageous situation of the parts of the human body.

The lobster is indisputably one of the most extraordinary creatures on the face of the earth. An animal whose skin is a stone, which it annually casts off to acquire a new corslet; an animal, whose flesh is in its tail and legs, whose hair is in its breast, and whose stomach is in its head, which is yearly renewed, while the first function of the new stomach is to digest the old one; an animal that has its eggs in the interior of the body previous to impregnation, but after that operation, carries them externally under its tail; an animal which sometimes has two stones growing in its stomach, and that feeds upon them till they are consumed; finally, an animal which can of itself get rid of its limbs when they are inconvenient, and replace them with others, and whose eyes are placed at the end of long moveable horns:—such an animal, I say, will long remain a mystery for the human understanding. Meanwhile, it bears witness to the skill of the hand that formed it, and affords us an opportunity of contemplating in its structure and economy the power and wisdom of the Creator.

NOVEMBER 19.

ADVANTAGEOUS SITUATION OF ALL THE PARTS OF THE HUMAN BODY.

If we examine our body with some attention, we shall not fail to observe, that all the parts which compose it have been arranged in the most convenient manner by the Creator. It depended on his pleasure to place them in such situations as he thought fit; but his wisdom has assigned to each member the most suitable position; and in forming

Advantageous situation of the parts of the human body.

the human body, he had an eye, not only to its necessities and its convenience, but likewise to its beauty.

All the parts of the body are situated in the manner most convenient for our wants. The human body was designed to be a machine, capable of moving itself without having occasion to receive an impulse from any external force. Our members were intended to execute with promptitude the commands of the soul. The bones are all connected: and in order that we may use them with convenience, that we may extend and shorten the arm, for instance, that we may raise ourselves erect, or stoop at pleasure, these bones are divided into several articulations. Each of these bones terminates in a ball, which is received into a socket formed for it in another bone, in which it plays without inconvenience, because it is covered with a smooth and polished cartilage, and furnished with an oily mucilage, which prevents attrition. In this contrivance nothing is more remarkable than that these bones are so firmly united that they neither slip nor are pulled out of their places, though the legs have often to support, and the arms to lift, very heavy weights.

In the arrangement of the parts of our body, God has likewise regarded our convenience. The resolutions and commands of the soul may be accomplished without difficulty and impediment by the different organs of the body. By means of the senses, the soul receives information of all that concerns it, and by the members of the body it executes all its wishes. The eye, which is destined to watch for the body, occupies the most elevated place; it turns with facility in every direction, and

Advantageous situation of the parts of the human body.

can observe all that passes. The ears, situated on either side, are open night and day to communicate to the soul the slightest sound, to inform it of the least motion, and to give it timely warning of every thing that occurs. As all the aliments pass through the mouth, the organ of smell is placed immediately above it, that with the eye it may give us notice not to admit any thing tainted or impure into the stomach. The sense of feeling has no particular seat, but is distributed throughout the whole body. The arms, by which the soul executes most of its desires, are placed near the chest, where the body has the greatest power, and in such a manner as not to be too far distant from the lower parts of the body.

Finally, in the formation of the human body, the Creator deigned to attend to its beauty. It consists in the visible harmony, or in the symmetry of the members, and in the pleasing intermixture of colors on a fine and delicate skin. Thus we observe that those parts of our body which are double, as the eyes, the ears, the arms, the legs, are placed one on each side; while those that are single, as the forehead, the nose, the mouth, and the chin, are situated in the middle. This proportion is observable in the whole figure, as well as in the details. The length of the sole of the foot is equal to the sixth part of our height, as the face is to one tenth. In children, the head is larger in proportion than the rest of the body, for this reason, because the head being the principal part, and the seat of four senses, ought at the very first to be the most perfect; and likewise, because it consists entirely of bones, and would otherwise have been incapable of the necessary degree of extension. For

we remark that, during infancy, all the members grow at the same time, and increase in length, breadth, and thickness in the most exact proportion relatively to the size of the whole body.

Admire, O man, the perfection and beauty of thy body, and the astonishing relations, harmony, and proportions which are preserved in all its parts. Observe how each member is adapted to the others, how all are placed in the most suitable situations, and how none ever embarrasses or impedes the rest in the performance of their respective functions. All these organs are so many wheels in the astonishing machine, which are fitted into each other in order to accomplish the various ends for which they were designed. Be careful, then, not to destroy or to injure this ingenious machine by irregularities and excesses. Be careful not to dishonor or degrade it by base passions: but let your body be a living monument of the wisdom and goodness of God. Above all things, use every exertion to procure the restoration of your soul, which has been so debased by sin, to its original beauty and purity, through the righteousness of your Redeemer. This, and this alone can justify you, when your body shall return to the dust of which it was formed.

NOVEMBER 20.

OF THE ORDER AND REGULARITY OF NATURE.

When we contemplate the universe, we discover traces of an intelligence, by which all the operations of Nature, in their whole concatenation, and at every period of time, were accurately foreseen, and weighed, measured, and adapted to some par-

ticular object. Hence it is that the universe, being once formed, might continue to exist for ever, and to fulfil the purposes for which it was designed, without the necessity of any alteration in the established laws of Nature. With the contrivances of men the case is often very different. Machines constructed by the most skilful artist, soon begin to go wrong, and grow worse and worse every day. The cause of these derangements lies in their original construction; for no artist, how intelligent soever he may be, can foresee or prevent all the changes to which his works will be liable.

The material world may likewise be regarded as a machine, composed of an infinite number of different parts, adapted to as great a variety of uses. It is divided into many globes, light and opaque, inhabited by living creatures of every possible kind. The latter move in prescribed orbits and regular periods round the former, that they may receive from them light and heat, day and night, diversity of seasons and temperature, according to the nature and wants of their respective inhabitants. The position of the planets and their mutual gravitation are so various, that it seems scarcely possible to fix the period when they shall all have returned to their original position, and shall again commence their great revolution. At the same time each year differs from all that have preceded it in temperature and fecundity. Notwithstanding this continual variation of the great phenomena of the world, and the astonishing multiplicity of their motions, not one of these prodigious orbs has, in the course of so many thousands of years, interrupted or obstructed any of the others in its course. All the planets regularly traverse their orbits in the allotted

time. They have neither approached nearer to the sun, nor receded farther from him. Their forces have ever remained the same, and preserved the same relation to each other. All the observations of the fixed stars that have been made for two thousand years, concur in assigning them the same appearance and the same distance from the pole. The height of the sun, day and night, the duration of the years and of the seasons, are still exactly the same as they have ever been:—an incontestable proof that in the original arrangement of the heavenly bodies, in decreeing the measure, the laws and the relations of their forces, and the direction and velocity of their course, the great Author of Nature foresaw all future contingencies of the universe, and of its component parts, to the utmost limits of time.

The same may be said respecting the phenomena of our earth, inasmuch as it is annually subject to different revolutions and variations of temperature. For though it may at first sight appear as if fair weather, cold, heat, dew, rain, snow, hail, thunder, lightning, and winds, succeeded each other at random, and followed no laws but those of chance; as if the waters inundated the earth by mere accident, and changed its surface, converting the land into sea, and the sea into land, engulphing and disgorging mountains, and removing the current of rivers: yet nothing is more certain than that every modification of the earth has its sufficient cause in that which precedes it, and the whole in the order established at its creation. Nothing is more proper to convince us mortals of our ignorance respecting the particular causes of natural events, and their connection with the future, than that diver-

sity which we observe in the temperature of the air, and in the aspect of the globe, and the fertility of the soil, which depends so much upon the former. We may make as many meteorological observations as we please, we shall never find two years perfectly alike, neither shall we be able to form any certain conclusions from the past respecting the future. Of this, however, we may rest assured, that the apparent confusion of the elements has not transformed the earth into an uninhabitable chaos, or changed its figure, or destroyed its equilibrium; but that, on the contrary, it is the natural means of preserving, from year to year, its order and fertility, and rendering it an agreeable and convenient habitation for man and animals. Since, then, every modification is the result of a preceding one, it is manifest that the elements have not been jumbled together at random, but that eternal wisdom meted out and commingled all the elements and their forces, with a due regard to their effects, till the latest period of time.

The world, therefore, is not a mass of crude and incongruous materials, of parts without relation or connection, but it is a regular and perfect whole, whose structure and arrangement are the work of an infinite intelligence. When we look round us, and see in the world a multitude of beings of the same nature as ourselves, and perceive the numberless bonds by which human society is linked together; when we observe a still greater multitude of other classes and species, and their mutual dependence; when we discover the various ways in which Providence modifies the elements for the benefit of the whole animated creation, and adapts them to the nature of each particular species; finally, when we give a far

Craig del. Pub. Feb. 1. 1808. by James Sandie London. Mackenzie sc.

wider range to our views, and consider the relations of our earth to the heavenly bodies, and the resemblance and connection that may subsist between them: these considerations cannot fail to excite in us the highest admiration of the magnificence, harmony, and beauty of Nature, and to produce the deepest conviction of the wisdom of the Creator. But all that we yet know respecting the order and beauty of the material world, is but as a feeble ray, which illumines us till we shall be removed to the regions of everlasting light; and the divine wisdom, which here is so often beyond our limited comprehension, shall be more clearly displayed to our view.

NOVEMBER 21.

OF THE WINTER OF THE NORTHERN REGIONS.

We are now drawing near those days which excite so much discontent among many people. To them winter appears to be a season which does not correspond with the wise plan of the government of God. The rich complain of the dreariness and uniformity of Nature; and the poor, whose wants are increased in winter, think they have sufficient cause to be dissatisfied with this season. But, ye ungrateful men, magnify as you please the miseries and inconveniencies of winter, you will perhaps be convinced of the superior comforts of your lot, and be obliged to esteem yourselves particularly fortunate, if you compare your condition with that of other people.

In many of the northern regions there is neither spring nor autumn. The heat in summer is as in-

supportable as the cold in winter. The latter is so intense, that spirits of wine freeze in barometers. When the door of a heated room is opened, the external air, which enters, converts all the vapors in the apartment into snow, so that those who are in it are encompassed with a thick cloud of white flakes. When they go out of their houses, they have a sensation as though their breast was cut with knives. The whole country wears the appearance of death, for not a creature is to be seen. Nay, the cold is sometimes, and that suddenly, so severe, that those who cannot escape with sufficient celerity, lose their arms, their legs, and very often their lives. The snow-storms are still more dangerous. The wind drifts the snow in such a manner, that it is impossible for those who are overtaken by it to find their way. All the trees and bushes are covered by it; the eyes of the wretched wanderer are dazzled by its whiteness, and at every step he plunges into a new precipice.

What would those who, in this country, complain of cold, say, if they were obliged to live in these inclement regions? In truth, we know not the advantages we possess, otherwise the slightest reflection would suffice to make us content with our lot. The days of winter, however dreary and severe they may be in this climate, are nevertheless supportable; and, if some people suffer much from them, it is always owing to their own fault.

But why has the Creator assigned so many thousands of men an abode in regions where, during the greatest part of the year, Nature is arrayed in terrors? Why has he not been as favorable to these people as to us? Silly questions! Those are egregiously mistaken who suppose that the inhabi-

Of the winter of the northern regions.

ants of the polar regions are unhappy on account of the severity and the length of their winters. These people, content amid their poverty, and exempt by their simplicity from all inordinate desires, lead a happy life in their inclement country, encompassed with mountains of ice, though strangers to those comforts which the natives of more southern climes deem essentially necessary to their felicity. If the sterility of the soil denies a variety of the productions of the earth, so much the more abundant is the supply which the sea affords them. Their way of life inures them to cold and tempests, and Nature has supplied the needful assistance to endure the rigors of the climate. She has peopled their deserts with wild beasts, whose furs protect them from the cold. She has given them reindeer, which furnish them with food, clothing, bedding, and habitations: which satisfy almost all their wants, and whose maintenance costs them very little trouble. When the sun does not rise above their horizon, and they would otherwise be enveloped in continual darkness, Nature lights up for them a brilliant aurora borealis to illumine their nights. These very people consider their country as the most comfortable region of the globe, and regard us with as much pity as we can possibly feel for them.

Thus every climate has its advantages and disadvantages, which are in general so nicely balanced, that it is difficult to determine which deserves the preference, except we are guided by certain particular partialities. Considered in this point of view, no country on the face of the earth, whether situated beneath a vertical sun, or whether the rays of that luminary fall obliquely

upon it, or whether it is buried under everlasting ice, can be pronounced superior to another. This produces a great number of the conveniencies of life; that is entirely destitute of these manifold blessings, but its inhabitants are at the same time exempt from numberless temptations to vice, corroding cares, and keen remorse: in a word, they are free from innumerable obstacles to happiness, which richly compensate the want of a multitude of conveniencies. So much we know to our consolation, that Providence has bestowed on every country whatever is necessary for the support and happiness of its inhabitants. Every thing is adapted to the nature of the climate under which they live, and they are supplied in the wisest manner with all that is requisite for their subsistence.

NOVEMBER 22.

TRANSFORMATIONS IN NATURE.

THE transformations that take place in Nature are extremely numerous, or rather, the whole physical world may be said to be in a state of incessant transformation. The forms of things are continually changing. Certain substances pass successively through the three kingdoms of Nature, and are gradually compounded into mineral, plant, insect, reptile, fish, fowl, quadruped, and man. Millions of bodies in Nature are annually mingled and reduced to dust. Where are the flowers which, during the summer, adorned our fields and our gardens? One species gave place to another, withered, and disappeared. After the primrose and the violet, in their modest dress, had announced the arrival

of spring, they were obliged to quit the stage, that we might admire the tulip and the rose. These were succeeded by others, till, at length, all the flowers had, in their turn, accomplished the end for which they were designed. It is the very same with mankind. One generation starts into existence, and another disappears. Many thousands of human bodies are every year reduced to dust; and from these decayed bodies, the materials for others, more beautiful are formed. The salts and oils of which they were composed, are dissolved in the earth; the more subtle particles are raised into the atmosphere by the sun, and being mingled there with other matters by the winds, descend in dew and rain, sometimes in one place, sometimes in another; while the grosser are blended with the earth. The herbage shoots up with a luxuriant growth; the cows and oxen eat the flesh of men, transformed into grass; in the udders of the former it is converted into milk; the milk is changed in our bodies into blood; and the blood nourishes our flesh, and the other parts of which our frame is composed.

The transformations in Nature are an incontestable proof that the Creator has designed that every thing should have its use. The pollen of flowers, which serves for their fecundation, is a very small portion of the powder belonging to each flower; the divine wisdom has therefore created the bee, to employ the superfluous dust in making wax. The earth daily presents us with new productions, and would at length be exhausted, if some return were not made for what it gives. All organic bodies are decomposed, and converted by slow degrees into earth. During this

decomposition, their volatile parts rise into the air, and are dispersed in every direction. Thus the remains of animals are dispersed through the air, as well as through the earth and water; and perhaps that portion of them which ascends into the atmosphere is by far the most considerable. All these particles, so dispersed, are soon combined into new organic bodies, which, in their turn, undergo the same changes as the former; and this circulation, these incessant metamorphosis, which commenced with the creation of the world, will only cease with its final termination.

The most remarkable transformation, or, at least, that which interests us most, relates to ourselves. We know that our bodies were not once composed of the same parts as at present, and that their present composition is not the same as it will in future be. Our bodies, before we came into the world, were extremely small; and since that period they have increased to fifteen or twenty times the bulk they then had; consequently blood, flesh, and other matters furnished by the vegetable and animal kingdom, and which formerly did not belong to our bodies, have since been assimilated to them, and become parts of ourselves. The necessity of a daily supply of food proves that there must be a continual waste of the parts of which we are composed, and that this loss must be repaired in that way. Many parts of our bodies insensibly evaporate; for, according to the accurate experiments which a celebrated physician made upon himself, it is found that, out of eight pounds of food which a healthy man takes in one day, the fiftieth part is converted into his substance; while all the rest passes off by perspiration, and other excretions: conse-

quently, in ten years, very few particles belonging to our present bodies will be left. And at last, when they have passed through various changes, they will have to experience the last awful transformation, when they shall be converted into dust, till the great day of resurrection, on which they will undergo that final change which shall place them in a state of everlasting felicity.

O how I rejoice in the expectation of that world, where none of these changes shall ever take place! I behold with perfect tranquillity the daily revolutions to which all terrestrial things are subject, and which are necessary in their present state. It is thus that they are continually approaching nearer to perfection, and toward that point I am myself advancing nearer and nearer every day. How can I do otherwise than rejoice in the expectation of this important change! When this earth shall have undergone its great final revolution, I shall be introduced into a new heaven and a new earth, which shall be free from the least shadow of variation.

NOVEMBER 23.

DISPLAY OF THE DIVINE POWER IN SMALL THINGS.

He who loves God, and delights to contemplate his works, will discover the hand of omnipotence, not only in the prodigious spheres which compose the universe, but also in the smaller worlds of insects, vegetables, and minerals. He will seek and adore the eternal wisdom of the Creator in the spider's web as well as in that power of attraction which keeps the planets in their orbits. These re-

searches are now facilitated by the use of the microscope, which discovers to us new worlds, comprehending in miniature whatever is calculated to excite our astonishment. Such of my readers as have not an opportunity to make use of this instrument, will at least derive some pleasure from the following particulars relative to these worlds in miniature.

Let us first consider the inanimate world. Observe the small species of mosses and grasses which God has produced in such abundance. How numerous and how delicate are the parts and fibres of which these plants are composed! How various are their forms and proportions! how innumerable their genera and species! Reflect how prodigious is the number of minute particles into which all bodies may be separated! If a body of one cubic inch contains one hundred millions of visible parts, who can calculate the number of parts contained in a mountain! If millions of particles of water can be suspended from the point of a needle, how many must there be in a single spring, or in all the springs, rivulets, rivers, and oceans! If a lighted candle emits, in one second of time, billions of particles of light more than there are grains of sand on the whole earth, how many particles of caloric must issue from a fire in an hour! If a grain of sand contains more than a thousand million particles of air, what an innumerable multitude must there be in the human body! If human art can dissolve a grain of copper into millions of parts, without coming at the elements of that matter; if odoriferous bodies can emit so many fragrant particles as to perfume the air to a considerable distance, without sustaining any perceptible diminution in their

weight; the human mind would require an eternity merely to calculate the prodigious number of these particles.

If we pass to the animated world, our views will be infinitely extended. The air in summer swarms with living creatures. Every drop of water is a world teeming with inhabitants; every leaf is a colony of insects; nay, every grain of sand perhaps serves for the abode of animated beings. Each plant, each seed, and each flower nourishes myriads of living animals. Every person must have seen what innumerable swarms of flies, gnats, and still smaller insects, collect together in a very small space? What hosts of them, then, must live, sport, and multiply in a space so prodigious as the surface of the whole earth, and the illimitable extent of the atmosphere! How many myriads of insects, still more diminutive, creep upon the earth, or are contained in its bosom, whose number is known to the omniscient God alone! With what splendor is his power manifested, when we reflect on the multitude of parts composing all these minute creatures, of whose very existence thousands of people are entirely ignorant! Did not experience convince us of the fact, should we ever have imagined that there could exist insects a million times smaller than a grain of sand, and yet possessing organs of feeling, motion, and generation? There are shell-fish so minute, that, when seen through a microscope, they scarcely appear so large as a barley corn, and yet they are living animals, with strong habitations, which are divided into numerous chambers, according to their different bendings and involutions. What a small animal is a mite: and yet this almost imperceptible point ap-

pears, when seen through a microscope, a perfect, hairy insect, replete with life and feeling, and provided with all the organs and members necessary for the end for which it is designed! Diminutive as this animal is, it is composed of many still more minute parts: and the most astonishing circumstance of all is, that the microscope which enables us to discover so many faults and irregularities in the most finished human productions, only displays the peculiar perfections of these minute works of Nature. How inconceivably fine are the threads of the spider's web! It has been calculated that eighteen thousand of them would not make a thread thicker than the finest sewing silk. Each of the six nipples, from which the spider extracts the glutitinous liquid for the thread of her web, has a thousand orifices, through which pass the same number of threads, so that each of those that compose the web is formed of six thousand smaller threads.

You are astonished, reader, and I am myself lost in amazement. But supposing that we had microscopes which magnified a million times more than those that we now use, what wonders should we discover! And do you imagine that we should then have arrived at the utmost limits of the creation? By no means: it would be folly and presumption to indulge such an idea. Each creature has a peculiar kind of infinity; and the farther you proceed in the contemplation of the works of God, the more numerous will be the wonders of omnipotence unfolded to your view. You are involved in pleasing uncertainty by the two extremes of Nature; and you scarcely know whether most to admire the greatness of the divine power in the prodigious spheres revolving in illimitable space, or its

fertility and ingenuity in those innumerable diminutive creatures, many of which are scarcely discernible. Let, then, the contemplation of the works of God, be henceforth your favorite occupation. The trouble which you take to study them will be amply compensated by the purest pleasures. You will at least feel an ardent desire excited within you to be speedily removed to that world, where you will have no occasion for microscopes to discern and to examine the wonders of God; where all his works will be presented in unveiled beauty to your view; where you will perceive the relations, the structure, and the destination of every object; where incessant hymns of praise are chanted to the Creator; where the difference between small and great will entirely cease; and where every object will appear to your soul invested with grandeur and majesty.

NOVEMBER 24.

GRADUAL INCREASE OF THE COLD.

We now feel the cold daily increasing. Last month took away from us a great portion of the autumnal heat; but the cold was still supportable, as the earth yet retained some part of the sun's warmth. The present month is colder; and the more the days decrease, the more the earth must lose of its heat, and the more intense the cold must become. This is a circumstance that cannot possibly escape our observation, since our feeling convinces us of the fact: but do we perceive the wisdom and the goodness of our Creator in this dispensation? The least reflection will suffice to convince us that the

gradual increase of the cold is the work of an all bountiful Providence.

This progressive augmentation of the cold is, in the first place, indispensably necessary for our bodies, whose health would otherwise be impaired, or utterly destroyed. If the cold which we experience in the winter months were suddenly to set in with the commencement of autumn, the change would benumb our frames, and inevitably prove fatal. Every body knows how liable we are to take cold in the cool summer evenings; and hence we may infer the consequences that would ensue from the abrupt transition from the heat of summer to the cold of winter. With what beneficence hath the Creator provided for our health and the preservation of our lives, in regulating the temperature of the months immediately succeeding the summer in such a manner as to prepare our bodies the better to endure the increase of the cold.—What would become of those animals, whose constitution cannot endure a great degree of cold, if winter were to surprize them without any previous notice? Two thirds of the birds and insects would in one single night be swept from the face of the earth, together with their embryo progeny. Now, on the contrary, by the gradual increase of the cold, they gain time to make such preparations as are necessary for their preservation. The interval between summer and winter gives them warning to abandon their summer retreats, and repair to warmer climes, or to seek such situations where they may securely pass the inclement season in undisturbed repose. To our gardens and fields the consequences would be still more fatal, if the heat of summer were abruptly succeeded by the cold of winter. All tender plants,

and especially exotics, would inevitably perish. The spring would be destitute of blossoms, and the summer of fruits.

It is, therefore, but just, reader, that you should be grateful for this dispensation of God, and adore the wisdom of the Creator displayed in it. When you observe how gradually the heat diminishes, and the cold increases, from the last days of summer till the commencement of winter, pass it not over as a matter of little importance. These changes were necessary, that you and all other creatures might subsist, and that the earth might continue to pour forth her blessings. You who so often presume to find fault with the laws of Nature, displace but one single wheel in the vast machine of the creation, and you will soon discover to your cost, that though you may disorganize, you cannot amend the arrangement of Nature. This circumstance may serve to convince you that in all Nature no revolution can take place without due preparation. All natural events rise gradually one out of another; they all happen in the most regular order, and at the appointed time. Harmony is the great law, according to which the Almighty governs the universe; and hence it is that all the works of God are so beautiful, so immutable, and so perfect.

Be it then your continual employment to study the beauty and perfection of the works of God, and to seek in every season the traces of his divine wisdom and goodness; then all those complaints, by which you so often dishonor your Creator, will cease: you will discover order, wisdom, and beneficence, even there where you imagined that you perceived nothing but disorder and imperfection. You will exclaim, with the fullest convic-

tion: "All the paths of the Lord are mercy and truth unto such as keep his covenant and his testimonies." (*Ps.* xxv. 10.)

NOVEMBER 25.

REFLECTIONS ON SNOW.

In winter, the most dreary season of the year, the earth is often covered with snow. Every body sees the snow fall, but very few give themselves the trouble to enquire into its nature. This is also the case with the most common objects, which we have daily before our eyes, and from which we are receiving continual advantages. These very things which are most deserving of our attention, are in general those of which we take the least notice. Let us distinguish ourselves by a different conduct from the generality of mankind, and now spend a few moments in the contemplation of snow.

Snow is formed of the most subtle vapors congealed in the atmosphere, before they accumulate and form clouds. They fall in what are called flakes, which are larger or smaller, according to the greater or less number of small flakes of which they are composed. In our climates the snow is never very small; but in Lapland it is reported by travellers who have resided for some time in the northernmost parts of that country, sometimes to resemble the finest dust. This is said to be caused by the extreme cold which prevails there; and we may remark that in our own country the flakes are smaller or larger in proportion as the cold is more or less severe. The small flakes of which the snow is composed, generally resemble hexagonal

stars; some, however, have eight angles, others ten, and others, again, are perfectly irregular. To examine them with the naked eye, we need only catch a few flakes upon white paper: but no satisfactory answer has hitherto been given to the question why Nature has moulded them into those particular forms. It might likewise be asked, why snow is so extremely light and white. The reason of this it is not difficult to assign. Snow is exceedingly porous, and consequently contains a great number of interstices, which are doubtless filled with air. It is composed of parts of different density. Such a substance does not admit the sun's rays, but powerfully reflects them, and this it is that gives it such a white appearance.

Snow that has recently fallen is twenty-four times as light as water; for twenty-four quarts of melted snow yield only one quart of water. Snow evaporates very considerably, even when the cold is most intense. It is well known that very lofty mountains are never entirely free from snow; for though part of it sometimes melts, the loss is soon supplied by new flakes from the cold upper regions of the atmosphere. As the air of plains is much milder than that of mountainous regions, it sometimes rains on the one, while deep snows descend upon the other.

Snow is of manifold utility. As the cold of winter is much more prejudicial to the vegetable than to the animal kingdom, the plants would perish if they had not a covering to protect them. God, therefore, directed the rain, which in summer refreshes the plants, to cover them in winter in the form of soft wool, and to skreen them from the injuries they would otherwise receive from the keen and piercing winds. Thus the snow preserves the

degree of warmth necessary for the vegetable which it covers; and some assert that it materially contributes to the fertility of the soil by means of the salts which it leaves behind on melting.* It then refreshes the earth, and at the same time washes away all impurities from the winter corn and plants. What the earth and vegetables cannot absorb, affords a seasonable supply to the springs and rivers, which have grown shallower during the winter.

These reflections, reader, may suffice to convince you of the goodness of God, in producing the meteor of which we have just been treating. The more you consider these truths, the less dreary winter, a season so dismal to many, will appear to you. Look up, with gratitude and joy to the Lord, who, even from amid the snow-storm, dispenses his blessings and his bounty upon the earth. Your murmurs and discontent are an offence against the wise government of God, and an offence so much the more heinous, the more manifest are the proofs of the divine bounty and intelligence.

NOVEMBER 26.

SLEEP OF CERTAIN ANIMALS IN WINTER.

A GREAT part of the creation now appears gloomy and dead, from the absence of those creatures which in summer gave such animation and interest to Nature. Most of the animals which have disappeared, are buried in winter in a profound

* The fallacy of this notion is demonstrated in the note, p. 35, vol. i. T.

sleep. Not only the caterpillars, but also the scarabæi, the ants, flies, spiders, snails, frogs, lizards, and serpents, pass the winter in a torpid state. The ants, which were long supposed to collect provisions for winter, are benumbed by the slightest degree of cold, and thus remain till the commencement of spring. Of what use then would be their stores, since Nature has taken care that they shall want no food; and it is not very probable that they would take the trouble to lay up hoards for other animals.—Among the feathered creation there are likewise many tribes which, when their food becomes scanty, conceal themselves in the earth or in caverns, where they sleep during the winter. It is at least asserted, that the sand-martins, at the approach of winter, seek retreats in the earth; that the house-martins repair to the holes of old buildings or trees; and that the common swallows, clinging together in couples, and attaching themselves to reeds, plunge into the water, where they remain till they are revived by the return of warm weather.

There are likewise some quadrupeds, which, toward the conclusion of summer, bury themselves in the earth. The most remarkable of these is the marmot, a native of the Alpine regions. Though these animals prefer a habitation on the highest mountains, amid ice and snow, they are more subject than any other to the benumbing influence of cold. The marmots, therefore, repair about the end of September, or the commencement of October, to their subterraneous retreats, where they continue till the beginning of April. In the construction of their winter habitation they display great art and precaution. It is a kind of gallery in

the form of the letter Y, which they burrow in the declivity of a mountain. The two branches terminate in an apartment without any outlet, and this is properly their habitation. One of these branches is considerably inclined, so as to carry off their excrements without difficulty; the other, which is level, serves for a passage to and from their dwelling. The latter is lined with hay and moss. They collect no provision for the winter, as though they knew before-hand that they should want none. Before they retire to their winter quarters, each of them prepares itself a bed of hay and moss, after which they close the two passages to their retreat with the utmost care, and consign themselves to sleep. During the whole period of their torpidity they never take the least food. At the beginning of winter they are so fat, that some of them weigh twenty pounds, but at the end of that season they are very meagre. As they take no food during the winter, they have no evacuations. Their cœcum has several annular folds, which retain the alimentary matter till the period of their awaking. We are assured that when these animals feel the first impression of the cold, they go to a stream, where they drink such an extraordinary quantity, that their urine is as clear as the water which they have swallowed. A natural instinct impels them to this action, to prevent the putrescence which might result from the matters accumulated in their stomach during the long interval of their torpidity. When they are discovered in their retreats, they are found rolled up in the form of a ball, and enveloped in hay, with their noses close to their bellies, which prevents their inhaling too great a quantity of humid vapors. Their

Sleep of certain animals in winter.

lymph wastes away exceedingly during the period of their torpor; and it is highly beneficial that they should have sufficiently attenuated their blood by copious drinking. In this state they may be carried away, and even killed, without manifesting any signs of sensation. The hamster, a species of rat, likewise sleeps as long and as profoundly as the marmot. Bears eat so prodigiously at the beginning of winter, that you would think they were laying in a supply sufficient for all the rest of their lives. Their skins cover a superabundance of fat, which enables them to endure their long abstinence during the repose of winter. The badgers likewise prepare themselves in the same manner for their torpid state in the inclement season.

These animals, and many others, are taught by this peculiar instinct implanted in them, how to dispense with food for a considerable period. In the first winter of their lives they know precisely the time when they ought to prepare for their long sleep, though they possess no almanac to apprize them of its approach. In their quiet retreats they are strangers to want, hunger, and cold; so that their whole life is a succession of summers. It is particularly worthy of remark, that all the animals do not sleep thus, but only those which have been enabled by Nature, not only to endure the cold, but also to fast for half the year. If winter surprized them unawares, so that they were all at once enfeebled and benumbed by want of food and cold, it might be asserted that there was nothing wonderful in this but the strength of their constitution; but as they prepare before-hand for the period of their sleep, with great precaution, and even ingenuity, it is impossible to forbear ascribing this in-

stinct to superior intelligence. Yes, this is thy wisdom, O God, who so tenderly lovest all thy creatures. Thy Providence is not confined to one method, to one uniform system in the economy of Nature. Thou hast ways, which for variety as well as adaptation, surpass all the inventions of the human understanding. Hence will I learn this cheering truth, that thou hast abundance of means to preserve and protect me amid the pressure of poverty and chilling cold.

NOVEMBER 27.

UTILITY OF STORMS.

PERHAPS in this stormy season many of my readers may be disposed to reckon winds and tempests among the disorders and scourges of Nature. But how few reflect on the advantages we derive from them, or consider that, were it not for them, we should perhaps be a thousand times more unhappy than we are. Yet nothing is more certain than that storms are the best means in Nature to purify the atmosphere. To be convinced of this, we need only pay a little attention to the weather which prevails at this season. How many unwholesome fogs, how many rainy, cloudy, and gloomy days does it bring us! Tempests are principally designed to disperse this accumulation of vapors. This is, therefore, one real and essential advantage accruing from storms. The great world is governed by the same laws as man, who may aptly be denominated a world in miniature. Our health depends, in a great measure, on a perfect mixture of all the different humors, which would otherwise be liable

to grow corrupt. So it is also with the world in general. A due mixture of the air is necessary to preserve its salubrity, or else it would soon become injurious to the earth and its inhabitants. This mixture is effected by the winds, and not by such as are gentle and light, but by tempests, which, forming one general mass out of the exhalations of a thousand regions, commingle the good and the bad, and thus correct the one by means of the other.

Tempests are also highly useful to the ocean. If the sea were not often violently agitated, what would be the consequence? Would not the stagnation, even of salt water, soon occasion a degree of putrefaction, which would not only prove fatal to the innumerable multitude of its finny inhabitants, but likewise highly dangerous to mariners? Motion is the soul of all Nature, keeping all things in order, and preserving them from destruction. Should the sea, in which so many millions of animal bodies and vegetables are daily undergoing putrefaction, and which is continually receiving such a prodigious quantity of all kinds of impurities —should the sea, I say, be the only exception to this general rule? It is impossible to entertain such a notion. The sea must have a motion as well as the blood of animals, and none of those causes which occasion an uniform, gentle, and almost imperceptible agitation, are sufficiently powerful to produce a new mixture throughout the whole mass. This, tempests alone can effect; and thus it is evident what important advantages hence accrue to man, and to so many millions of living creatures.

These are only some of the benefits which we derive from storms, and they are sufficient to convince

us of the absurdity of the notion entertained by the generality of mankind, that they are destructive scourges, and instruments of the wrath of the Creator. It is true that many a richly-freighted vessel is hurried by tempests to the bottom of the liquid abyss; that they have hundreds of times annihilated the hopes of the husbandman and of the gardener; that they have laid waste whole provinces, and spread terror and desolation far and wide; but what is there in Nature that may not, under certain circumstances, be considered as injurious? Shall we number the sun among the scourges of the globe, because, during a portion of the year, his position suspends the fecundity of the earth, and at another time scorches our corn-fields and our meadows? None of the phenomena of Nature ought to appear formidable to us, except those whose utility is nothing in comparison of the mischiefs which result from them. Can this be said of tempests, when we reflect on the advantages they procure for man and animals? What must those have done, who so bitterly lament that God did not consult them upon the great work of creation, and who would have confined all the tempestuous winds for ever in their secret retreats, when they perceived how many advantages they were deprived of, together with them? Can they forbear acknowledging that God has arranged every thing with wisdom, and that it is most advisable to be satisfied with the present economy of Nature? Happy are those who are convinced that the constitution of the world is adapted to the general welfare of all creatures: that the evils existing in the world are compensated by numberless benefits; and that the very means which Providence makes use of to chastise

us, are indispensable blessings, whose general utility infinitely overbalances any partial evil, which in certain instances may result from their operation.

NOVEMBER 28.

FORTUITOUS EVENTS.

To speak correctly, chance can produce nothing; for whatever happens, must have some real cause. What is commonly called chance, is nothing but an unexpected combination of various causes, which produces an effect that we could not have foreseen. Experience shews that such cases frequently occur in human life. Unexpected accidents may change the fortunes of men, and frustrate all their designs. It would seem natural that the race should be to the swift, the battle to the strong, and success to those who possess the greatest wisdom and prudence. The attentive observer, however, soon discovers that this is not always the case, but that an unforeseen accident, a favorable circumstance, an event that could not have been expected, often effect more than the combined efforts of human strength, skill, and intelligence. In what misery would not men involve themselves, if the gracious hand of an omniscient God did not govern all events! How could he govern them, unless chance also were subservient to his commands? The destiny of men, of families, and even of empires, depends sometimes on circumstances, which to us may appear trivial and contemptible. If, therefore, we would withdraw those events from the superintendence of divine Providence, we should at the same time deny its influence on the great revolu-

tions and more important occurrences which take place in the world.

We see that a great number of circumstances are daily happening, on which our happiness and misery in a great measure depend. We must acknowledge that we are incapable of guarding against such events, because we cannot foresee them. This very reason would justify the conclusion, that these unlooked-for events, which are beyond the compass of our understanding and of our prudence, must be under the especial direction of divine Providence. The wisdom and goodness of God leave us more or less to ourselves, according as we have more or less strength and understanding to conduct ourselves with propriety. In those cases, however, in which our efforts can be of no avail, we may rest assured that God will take us under his particular care. In all other circumstances, the industry and the prudence of men must concur with the favor and assistance of heaven: it is only in unforeseen accidents that Providence acts alone; and as we discover manifest traces of the wisdom, goodness, and justice of the Almighty in what we denominate chance, it is obvious that chance itself is subject to the divine government. Nay, what is still more, it is in this that the empire of Providence is particularly manifested. When the beauty, the order, and the arrangement of the world fill us with admiration, we conclude that it must have been created by a Being infinitely wise. How much stronger reason have we to form the same conclusion, when we reflect on the astonishing events which unforeseen accidents often produce! Have we not a thousand examples that the happiness, and even the lives of men, the fate of empires, the issue of wars,

Fortuitous events.

the revolution of kingdoms, and other important events, depend upon contingencies which human wisdom cannot foresee! An unlooked-for event may confound the ablest projects, and frustrate the efforts of the most formidable power. On this truth are founded our faith, our contentment, and our hope. However great may be the evils which surround us, however imminent the dangers with which we are threatened, God has always abundance of ways and means for our deliverance, though they are unknown to us, and even beyond the reach of our understanding. The firm persuasion of this truth cannot fail to excite in us the most profound reverence for the lord of the universe; to induce us to seek him in every place, to ascribe all things to his government, and to inspire us with confidence in the powerful protection of Providence. This truth, also, cannot but repress our pride, and particularly fill the hearts of those in exalted stations with a religious awe of that Being, who possesses so many invisible means, and employs a thousand unforeseen accidents to overthrow the fabric of that happiness which our arrogance has reared. Lastly, nothing is better calculated than this truth to banish from the soul all despondency and distrust, and to soothe and cheer the heart. The infinitely wise Being has a thousand wonderful ways of accomplishing his will; grace and mercy preside over all his dispensations, and his ways are justice and truth. When he deigns to confer a blessing on his children, nothing can prevent the execution of his purpose; he commands, and all Nature is obedient to his will.

NOVEMBER 29.

OF THE GREATNESS OF GOD.

IT is a duty incumbent on every human creature to endeavor to form such ideas of God, as are in some degree worthy of his greatness and majesty. It is true, that it is as impossible for us to comprehend his essence and attributes, as to measure the waters in the hollow of our hand, or to mete out heaven with a span. God is at the same time perfectly manifest and profoundly concealed; very near, and highly exalted above us: manifest and near with respect to his existence, but exalted and concealed as to his nature, his attributes, and his dispositions. The more, then, we ought to strive to discover so much of his majesty as is necessary to inspire us with those sentiments which are so justly his due. To assist our weak understandings in this respect, let us compare him with things of which men entertain the highest notions, and we shall find that he infinitely surpasses them all.

We admire the power of kings, and are filled with astonishment when we hear of their conquering mighty empires, taking fortified cities, erecting magnificent edifices, and making whole nations either happy or miserable. But if we are struck with the power of a man, who is but dust and ashes, whose exploits are achieved by the hands of others, how much more ought we to admire the omnipotence of God, who laid the foundations of the earth, who created the heavens, who guides the prodidigious orbs that revolve in the firmament and sustains the immense fabric of the universe! We are justly astonished at the heat of the sun, at the im-

petuosity of the winds, at the roaring of the waves, at the rolling of the thunder, and at the rapidity of the lightning; but it is God who imparts fires to the sun, who thunders in the clouds, who commands the winds to rage, and who agitates the billows of ocean.

We justly respect those who have distinguished themselves by uncommon genius, and by the extent and profundity of their knowledge: but what understanding can be compared with the wisdom of that Being, to whom every thing is exposed; who numbers the stars in the firmament, as well as the sands on the sea-shore; who knows the course which every drop of rain takes through the air; who surveys at one glance the past, the present, and the future. What wisdom hath he displayed in the structure of the universe, in the courses of the stars, in the formation of the globe, in the production of the smallest flower, and of the most diminutive insect. These are all master-pieces of infinite intelligence, which far surpass the greatest works of human ingenuity.

Riches have many admirers. We are dazzled by the splendid furniture, the magnificent apparel, the superb apartments, the profusion of gold, silver, and precious stones which we behold in the palaces of kings; but what are all these when compared with the riches of the Lord our God, who has the heavens for his throne, and the earth for his footstool! The earth is the Lord's, and all that is therein. He provideth habitations for all his creatures; from his store-houses he supplieth man and beast with nourishment; his meadows and pastures give subsistence to innumerable flocks and herds. All that is useful and excellent in the world is drawn

from his treasures. He has in his power life, health, riches, honors, and a whole heaven of bliss, which he distributes according to his good pleasure.

We are accustomed to pay respect to powerful princes who rule over extensive territories. But what is that little corner of the globe, over which they reign, to the empire of the universe, of which the earth is but a small province; an empire that comprehends all the orbs of heaven and their inhabitants! How great must be that monarch who has all the princes of the earth for his servants, around whose throne the cherubim and seraphim stand ever ready to execute his commands! We judge of the goodness of men by their actions. We bestow praises on kings who have founded cities and erected palaces, who have prosperously governed their dominions, and successfully accomplished important enterprizes; but what are their most brilliant deeds when compared with the creation of the boundless universe, with the preservation of so many creatures, with the wise and just government of innumerable worlds, with the redemption of mankind, with the reward of the good, and the chastisement of the wicked.

O Lord, none is like unto thee! Thou art great, thy name is glorious, and thy works proclaim thy majesty. Can we form a conception of any thing so magnificent as the Lord our God! Should not a religious awe seize our souls when we place ourselves in spirit in his presence, and think that he encompasseth us on every side! As the stars vanish before the sun, so are all the glory, wisdom, power, and riches of the world eclipsed by the resplendence of the divine majesty. Are not our souls

enlarged and exalted by these sublime meditations? Do they not strengthen and delight all the faculties of our minds? Are we not filled with veneration, astonishment, and rapture when we contemplate the Being of Beings, the Eternal, the Omnipotent, the Infinite God? Can we forbear exclaiming: The Lord is God! The Lord is God! Give to our God the glory!

NOVEMBER 30.

MOTIVES FOR CONTENTMENT.

OPEN your heart, O Christian, to sweet content. God is good; his love and beneficence are displayed in all his works. Contemplate the wonderful productions of his hand; the universe and all that it contains announce his glory; whatever he has created is worthy of him.

The heavens and the earth are evidences of his power; the orb of day, and the luminary of night, every thing endued with life and motion extols the mighty God.

Consider the works of his hand; men and brutes teach you that his power is infinite; and objects the most diminutive, the blade of grass and the particle of dust proclaim the Most High.

Ask the mountains and the vallies, the heavens above and the abysses of the deep, the winds and tempest, and the reptile that crawls in the dust; they will tell thee that his wisdom is infinite, that his power is unbounded.

O how I ought to celebrate him! With what songs of praise can I worthily extol that God who

gave me existence and life! My body, and the soul which animates it, are the gifts of his hand. O Lord, while I have being I will bless thy holy name.

The object of his paternal care during the day, each morning attests that he has watched over me amid the darkness of night. Every moment that glides away invites me to bless thee, who art the light and the strength of my life.

When oppressed with adversity and overwhelmed with affliction, he hastens to enable me to support it; his victorious arm is stretched forth to assist me, and all my difficulties vanish.

Long and often hast thou experienced his loving kindness, O my soul; forget it not; neither give way to the fear of being abandoned by that God who cannot hate any of his children.

Let us then submit to his holy will; let us bless all his dispensations, in full conviction that he will accomplish his merciful designs, for he is great in counsel and abundant in resources.

NOVEMBER 30.*

GRATEFUL RECOLLECTION OF THE DIVINE BLESSINGS.

ALMIGHTY GOD! thou art the father of all the creatures that dwell on the earth: thou art also my father. On thee I am absolutely dependent, not only for my existence, but for every thing I possess. With unfeigned gratitude I thank thee for all the mercies thou hast bestowed upon me till the present moment.

I adore thy bountiful Providence for the endear-

Grateful recollection of the divine blessings.

ing ties of family connections, and for having granted me the participation in the joys of domestic life.

I thank thee for the health and temporal prosperity which I enjoy; for the abundance with which thou furnishest my table; for the clothing with which thou coverest me, and the habitation which thou hast assigned me.

I thank thee also for the success which has hitherto crowned my undertakings, and for every faculty which has contributed to my prosperity and temporal happiness.

I have likewise reason to be grateful to thee, because, if at any time thou hast permitted affliction or distress to visit my habitation, thou hast not left me without support and consolation; but amidst thy just chastisements hast again vouchsafed to shew me thy favor. Thy paternal hand has ever assisted me, and it has been thy delight to confer blessings upon me.

The innumerable manifestations of thy goodness, which in time past I have experienced, inspire me with courage and confidence to resign myself and all my concerns to the direction of thy Providence. I venture therefore to hope that, if thou thinkest it for my good, thou wilt protect me in future from all the afflictions and disasters that would interrupt the happiness of my life. Grant, O God, that with an upright and cheerful heart I may enjoy the favors which thou bestowest, and that, amid my felicity, I may never forget thee, the giver of all good. But if, in thy inscrutable wisdom, thou hast decreed that affliction and adversity should be my portion, I will submit with humble resignation to thy dispensations, and will glorify thee, even under tribulation, to the utmost of my ability.

Hymn of praise.

Unto thee, O Lord our God, thou father of all creatures that are in heaven and upon earth, be honor and glory, now and evermore!

DECEMBER 1.

HYMN OF PRAISE.

When all thy mercies, O my God,
My rising soul surveys,
Transported with the view, I'm lost
In wonder, love, and praise.

O! how shall words with equal warmth
The gratitude declare
That glows within my ravish'd heart!
But thou canst read it there.

Thy Providence my life sustain'd,
And all my wants redress'd,
When in the silent womb I lay,
And hung upon the breast.

To all my weak complaints and cries
Thy mercy lent an ear,
Ere yet my feeble thoughts had learnt
To form themselves in pray'r.

Unnumber'd comforts on my soul
Thy tender care bestow'd,
Before my infant heart conceiv'd
From whom those comforts flow'd.

When in the slipp'ry paths of youth
With heedless steps I ran,
Thine arm unseen convey'd me safe,
And led me up to man.

Through hidden dangers, toils, and death,
It gently clear'd my way,
And through the pleasing snares of vice,
More to be fear'd than they.

DECEMBER
Clennell del.
Pub. March 12. 1808 by M. Cundee London
Marten Sc.

When worn with sickness, oft hast thou
With health renew'd my face;
And when in sin and sorrows sunk,
Reviv'd my soul with grace.

Thy bounteous hand with worldly bliss
Has made my cup run o'er,
And in a kind and faithful friend
Has doubled all my store.

Ten thousand thousand precious gifts
My daily thanks employ,
Nor is the least a cheerful heart,
That tastes these gifts with joy.

Through ev'ry period of my life
Thy goodness I'll pursue;
And after death in distant worlds
The glorious theme renew.

When Nature fails, and day and night
Divide thy works no more,
My ever grateful heart, O Lord,
Thy mercy shall adore.

Through all eternity to thee
A joyful song I'll raise,
For O! eternity's too short
To utter all thy praise.

DECEMBER 2.

OF THE ORIGIN OF THE WORLD AND OF MANKIND.

If we fix the epoch of the creation of the world according to the testimony of the sacred scriptures, we shall find that it cannot have existed more than six thousand years. Those who suppose it to be more ancient are contradicted by reason and by history. The history of mankind does not go far-

ther back than the accounts given in the Bible; all the particulars respecting nations of still higher antiquity being unsupported by the shadow of evidence. Indeed, the history of the nations of the highest antiquity is dated only from the general deluge. The chronicles of the Chinese are evidently false. The Phenicians had no historian of greater antiquity than Sanchoniatho, who lived after the time of Moses. The Egyptian history goes back no farther than Ham, the son of Noah; and the writings of Moses are, after all, the most ancient, as well as the most authentic historical monument extant. If the world were some thousand years older than we imagine it to be, the number of its inhabitants would far exceed its present population. The human race has been progressively increasing ever since the deluge; and it is still capable of supporting more than thrice the number of inhabitants which it now contains. It has been calculated that at least five thousand millions of men might live upon the globe, and the actual number does not exceed one thousand and eighty millions. This is one argument to prove that the world cannot be very ancient.

If we consider the arts invented by men, we shall find that they have all been discovered within two, or at most, three thousand years. Not only reason and Nature give man an aptitude for the arts and sciences, but he is impelled to cultivate them by necessity, and the love of convenience, comfort, and luxury. This impulse has powerfully operated among men in all ages. History, therefore, enables us to look back to those periods when scarcely the most necessary arts were invented, when these were still extremely imperfect, and when men had

as yet discovered only the first rudiments of the sciences. Four thousand years ago men were perfectly barbarous and ignorant. From the progressive increase of knowledge during this period, it is possible to determine, with tolerable accuracy, the period when they knew nothing, or, in other words, the epoch of the origin of the human race. Had they inhabited the earth for a long series of ages previous to the æra at which we fix the creation, the most useful and necessary arts could not possibly have remained unknown during all that time. All the discoveries of which the human mind is susceptible would long before have been made. Hence, then, we must necessarily conclude, that the origin of mankind cannot be more ancient than the date assigned to it by Moses in the history of the creation. Would it not be contrary to sound reason and experience, to suppose that the human race remained for some thousands of years enveloped in the thickest darkness, and in a state of profound lethargy, from which it suddenly awoke, and began to exercise its ingenuity in the invention of all sorts of arts, and in procuring all the comforts and pleasures of life?

Another circumstance is worthy of notice. Almost all Europe was formerly covered by immense forests, and contained very few cities, towns, or villages. Hence it is evident that the number of its inhabitants must have been much smaller than at present. Germany, for instance, was one continued forest. The inhabitants cultivated only a few open places that happened not to be overrun with wood. They had no regular establishments, and every year changed their place of abode. The whole country contained not a fruit-tree, unless that

name may be given to the oak. If, then, we wish to draw a comparison between the population of ancient and modern Germany, we must, in the first place, deduct all the inhabitants of the cities and towns. We must take into consideration the numerous colonies which Germany sends into foreign countries. Most of the forests being now cut down, and the space they occupied being employed in agriculture, we shall find that Germany in ancient times contained scarcely a tenth part of the cultivated land that it now does, and consequently not more than a tenth part of its present population. How many millions of men must it then have had less than in modern times; and how prodigiously its inhabitants must have increased since! Yet the forests and deserts which extend from Germany to the north-east of Europe and Asia, and those still remaining in Africa and America, evince that the globe is capable of supporting a population much more numerous than the present. The farther we penetrate into the ages of antiquity, the more woody, the more uncultivated, and the less populous we find the earth. This proves that the world cannot be of everlasting duration, otherwise it would from time immemorial have contained at least as many inhabitants, and the earth must have been quite as well cultivated as at the present day.

All these considerations lead me up to thee, Almighty Creator of heaven and earth! Thou gavest being to the universe and to man, and through thee all things exist. Thou art thyself without beginning; thou wast before the universe and its innumerable inhabitants sprung from nought, and thou wilt still be when new worlds shall succeed those which are now running their appointed course.

And—O ravishing thought!—I too shall continue to exist! What celestial transport doth this idea impart! When the heavens shall have passed away, I shall still live,—yea, live in the enjoyment of everlasting bliss!

DECEMBER 3.

UTILITY OF WOOD.

HOWEVER important and diversified are the advantages which we derive from every, even the smallest part of a tree, they cannot be compared with those which we are every moment receiving from the wood. Such is its abundance, that we might be tempted to suppose that God daily creates a fresh supply in order to prevent any want of so useful a material. It is, in truth, of manifold utility, because it is soft enough to take any form we choose to give it, and so solid as to retain any shape it has once received. It may easily be split, cut, bent, and polished; and by means of these properties which wood possesses, we procure from it many necessaries, ornaments, and conveniencies.

These, however, are by no means the greatest advantages we derive from wood, as most of them only contribute to the purposes of convenience or luxury; and there are still more indispensable necessities, which the strength and solidity of wood enable us to supply. Nature, indeed, furnishes us with abundance of hard and extremely compact substances. We have stones and marbles, which we can adapt to a variety of purposes; but they are so difficult to be procured and worked up, and at

the same time so inflexible, as to require a very great expence of time, trouble, and money; whereas on the contrary, the trunks of the largest trees may be applied with more facility and less cost to any purpose we may think fit. Wooden piles are driven to the depth of sixty or eighty feet in the earth, and thus form a safe foundation for walls, which would otherwise sink into the sandy or marshy soil. These piles, thus forcibly driven into the ground, form a forest of immoveable, and sometimes indestructible trees, which support the weight of the most extensive buildings as securely as the most solid rock. Other pieces of timber sustain the stone or brick work, and the weight of the tiles, slates, or lead, of which the roofs of our houses are composed.

In many countries wood is essentially necessary for the preservation of human life, being the chief article of fuel, without which the inhabitants could neither preserve their health, nor satisfy one half of their wants. The sun, indeed, is the soul of Nature, which animates all things; but it is not possible to concentrate a sufficient quantity of his rays to dress our food,* or to melt our metals. In

* This might undoubtedly have been true at the time the author wrote, but an article in a late number of one of our most respectable periodical publications, shews that they now "manage things otherwise in France," a country that has long been distinguished for the brilliancy, rather than for the usefulness of its inventions. In the Monthly Magazine, No. 164, p. 470, is the following notice: "A gentleman who was lately at Paris, mentions that some experiments had been tried at Marseilles, to ascertain the practicability of applying the sun's rays for culinary purposes. A number of mirrors were so placed in a frame, shaped like the

such cases, therefore, wood supplies the place of the sun, and leaves the degree of heat at our own option. The long nights of winter, the cold fogs, and the keen north winds would chill the blood, did not the kindly heat which wood affords, protect man from the effects of the frost. How necessary, then, is this material, and how wisely hath God provided for the welfare of his creatures in covering part of the surface of our globe with forests!

But do you who reside in the countries to which I have alluded, regard the advantages which you receive from the use of wood in these cold days of winter, as an especial favor of the Almighty? Have you reflected what an addition your Creator has made by means of it to your comfort and happiness? Perhaps the ease with which wood is procured, and the continual use you make of it, have rendered you indifferent to the advantages it affords. Wood is obtained, to be sure, with greater facility than gold or diamonds; but does it, therefore, cease to be a particular favor of Providence? Does this cancel any part of the obligation you owe to your Creator for this blessing? In my opinion, on the contrary, these very circumstances, that wood is so abundant, that it grows without our in-

section of a concave sphere, as to fling intense reflected light on the bottom and side of a black kettle. The water within was raised to the boiling point, and with a little attention to shift the situation of the circle of mirrors, was kept hot for a long time. Coffee or soup was thus boiled sufficiently. It is hoped," continues the writer, whether seriously or ironically I shall not pretend to determine, "that in the summer season this instrument will supersede the necessity of fuel enough to indemnify the expence of purchase." T.

terference, and that it is so easily procured, ought to excite you to bless your Maker so much the more fervently for this gift. You see, from this instance, that he has conferred on us in abundance such objects as are useful and essentially necessary, and that he has dispensed his gifts in proportion to our wants. These reflections would afford you a rich subject of gratitude, if you but accustom yourselves to cherish the impression. For how many edifying meditations would winter furnish occasion, if you were to bestow due attention on the blessings which Providence particularly confers in this season! When you enjoy the warmth which wood imparts, would it not be natural to exclaim: "O gracious Father, this also is one of thy benefits! With profound gratitude I receive it from thy hand. For this warmth which refreshes my benumbed limbs, I am indebted to thy Providence. In the winter's cold as in the summer's heat, in the open air as in the warm apartment, thou approvest thyself my benefactor. Never will I forget the blessings which thou conferrest upon me: and as in every season of the year I receive particular marks of thy beneficence, so also will I praise thee in every season. I will no longer regard wood with indifference, but will thank thee also for that valuable gift."

DECEMBER 4.

REMARKABLE CIRCUMSTANCES RELATIVE TO CERTAIN ANIMALS.

We daily experience the manifold benefits which we derive from animals. Some have been given us by the Creator for agreeable companions, and others

to afford us sustenance; but all are destined to minister, more or less, to our necessities and convenience.

The dog is by no means such a contemptible animal as he is generally taken for. Besides the beauty of his form, he possesses strength, speed, and vivacity, qualities which cannot but endear him to man. He is endued with acute sensibility, which is farther improved by education, and renders him a pleasing companion. He takes part in every thing that is to be done, watches for our security, defends and caresses us by turns, and knows how to gain the affection of his master by incessant services and expressions of attachment. Without the assistance of the dog, man would not have been able so easily to vanquish and subdue the other animals. This faithful domestic farther deserves our particular notice, because he performs many actions which prove that he is not merely a machine, but possesses some principle of intelligence. The language of the dog is more copious and varied than that of any other animal. How expressive are the signs by which he manifests his joy at the return of his master! And yet how different are they from those which he gives when he discovers a thief, when he sees a wolf, or pursues a hare! What ardor, what prudence, and what sagacity are displayed in all his motions!

The advantages which we receive from the sheep are still more various, though it has not the gift of pleasing like the dog. Every part of the sheep is useful to us: its milk, its wool, its flesh, and even its bones are serviceable to man. A remarkable circumstance in this animal is, that it chews the cud; at first swallowing the food hastily, without

sufficiently masticating it, and afterwards bringing it up again, chewing and swallowing it a second time. Because the animal has but one row of teeth, this deficiency is compensated by its having four stomachs. In the first, which is very large, the food, collected nearly in a crude state, is softened and moistened. In the next, which is much smaller, the food is farther macerated, and digestion commences. Hence it passes into the third stomach, which is the smallest of the four, and in which it is retained till it is sufficiently attenuated. To this end this third stomach is composed of a great number of folds, which permit nothing to pass through till it is perfectly dissolved. Finally, in the fourth digestion is completed; the food, which in the third stomach was green, now becoming as white as milk.

The hare possesses sufficient sagacity for her own preservation, and to enable her to escape from her enemies. She knows what situation to chuse for her form, concealing herself between clods of earth and in furrows, which are nearly of the same color as her skin. In winter she prefers a retreat with a southern aspect, but in summer selects one that looks toward the north. When pursued by the dogs, she runs for some distance straight forward, then returns upon her steps, and after many doublings, darts into a bush, and there conceals herself. She is cunning enough to keep continually changing her hiding-place, and always according to circumstances. The stag, which, on account of his beautiful and elegant figure, his horns, which serve rather for decoration than defence, his large size, his strength and speed, is one of the principal ornaments of our forests, is still more wily and sub-

tle than the hare, and often leads the most skilful huntsmen a much more arduous chace.

When I consider these and all other animals, I am anew convinced of the loving kindness with which the Almighty provides for my support, my pleasure, and my convenience. The earth is designed for the habitation of a prodigious variety of animals; the soil of which is so diversified only that a greater number of creatures may find on it the subsistence which is adapted to their different natures. Is not every soil, whether good or bad, sandy or marshy, rocky or wet, from the banks of the rivers to the summits of the monntains, covered with domestic animals, which favor man with their society merely to enrich him? The refuse of our kitchens and of our granaries is daily converted by our poultry into a palatable and nutritious aliment. The delicate flesh of the pigeon amply repays us for the trouble and expence of procuring it a cleanly and safe habitation; and the swan clears our ponds of the plants which grow upon them. Whole flocks of geese and ducks furnish us with feathers that we may repose the more comfortably, and require nothing but a scanty portion of food, and a pond in which they may sport, and wash themselves, and dive in quest of insects. In a word, no spot is so sterile as not to afford some species of animals that are useful to us. How then can I help acknowledging this superabundant goodness of my God? Would not the very sight of the creatures which God has created for my advantage, overwhelm me with confusion? O no! I will not be guilty of such ingratitude. All the gifts of Nature shall teach me to taste and feel how good thou art, and how highly I have been favored by thee.

Of the formation of snow, and its different figures.

The earth, the empire which thou hast assigned to man, lies extended before me. And what, O Lord, is man, that thou shouldst be mindful of him, and the son of man, that thou shouldst seek him out, and confer favors on him! He is inferior, indeed, to angels; but yet he is thy child; thou designest him to participate in everlasting felicity, and hast clothed him with glory and honor. Thou hast made him the monarch of thy creation, and hast subjected all creatures to his dominion; the fierce bull, whose bellowing resounds over hill and dale; the gentler sheep; the animals which people the forest; the feathered inhabitants of the air; and the finny legions which swarm in the deep.

DECEMBER 5.

OF THE FORMATION OF SNOW, AND ITS DIFFERENT FIGURES.

SNOW is a species of hoar-frost, differing from it only in this particular, that hoar-frost falls in the form of dew on other cold bodies, which attracts humidity, and to which it adheres in this state; whereas, snow is formed in the atmosphere of congealed vapors, which, if they are not prevented by the density or the motion of the cold air, fall according to the same laws which are followed by fogs, dew, and rain. The air is often extremely cold; and this cold may be increased to a considerable degree by the density of the atmosphere, and the accession of acid vapors. Hence it is easy to conceive how the aqueous vapors subsisting in it, are congealed; but the cloud

contribute more than any thing else to the production of this degree of cold; for every snowy day is in general cloudy. Clouds moreover intercept the rays of the sun, and the thicker they are, so much the more they prevent their action. This cause alone is capable of producing intense cold: for a very thick and distant cloud, which thus obstructs the rays of the sun, may occasion in the upper regions of the atmosphere such a degree of cold as to deprive the aqueous vapors of their fluidity, and to convert them into snow. But, upon this principle, might it not sometimes snow in summer? It is possible that snow may be formed, even in the midst of summer, in the superior regions of the atmosphere; but even in the coldest days of that season, the cold is never so intense as to prevent the frozen vapors from being dissolved by the warmth of the inferior regions, and consequently they can no longer appear in the form of snow. But in winter, when the cold near the earth is very great, the frozen vapors cannot then receive a sufficient degree of heat to dissolve them, and they therefore retain the form of snow.

An attentive observer of the works of God will find in this phenomenon abundant occasion to reflect on the divine power and wisdom; for he must perceive that even the flakes of snow are formed by Nature with perfect regularity. What would be our surprize, if, on beholding them for the first time, we were informed that this brilliant meteor is composed of particles of vapor! How suddenly it is formed, and how unexpectedly we are surrounded with the infinite multitude of flakes descending from the atmosphere. It affords the eye a pleasing spectacle, and the mind an instructive subject for

reflection. We may then, from experience, exclaim with the pious Brockes:* "Even frost has its charms, and winter its delights. Such only who pay no attention to the works of God, can remain strangers to pure and innocent pleasures."

DECEMBER 6.

WINTER PLANTS.

It is a mistake to suppose that winter is generally prejudicial to the vegetable creation; it is, on the contrary, an undeniable fact, that the variations of heat and cold contribute materially to the growth and fertility of plants. In the hottest climates there are prodigious deserts, which would be still more barren, were they not subject to vicissitudes of temperature. Winter in its utmost rigor is so far from being inimical to vegetation, that it rather increases and promotes it. The coldest regions, like the hottest, have their peculiar plants, which flourish under the snow, and in the severest seasons. A great number of trees, for example, the fir, the pine, the juniper, the cedar, the box, and the larch, thrive in winter as well as in any other season of the year. The house-leek, stonecrop, sage, marjoram, rosemary, thyme, lavender, rue, and other plants of the like kind, retain their

* Brockes was a German poet, who lived in the early part of the last century. His works, though they want grandeur and sublimity, and are overloaded with minute details, gave, however, such an impulse to the youthful genius of the celebrated Gessner, as induced him to devote it entirely to the poetic muse. T.

verdure during the winter, and there are even some flowers that spring up under the snow. The single anemone, the early hellebore, the cowslip, the winter hyacinth and narcissus, the primrose, the snow-drop, and all the species of mosses, flourish during the cold. Botanists assure us that the plants of the frigid zones, when placed in green-houses, cannot bear a higher degree of heat than thirty-eight degrees; for they thrive as well in Sweden, without care, during the winter, as most of those of France, Germany, Russia, and the northern parts of China. The plants of the coldest climates can endure the most intense frost in green-houses, but cannot bear any heat. The same observation applies to all the vegetable productions of lofty mountains, under whatever latitude they may be situated. High mountains, or rocks, whose summits are covered all the year with snow, have plants peculiar to themselves. Thus the rocks of Lapland produce a variety of vegetables, which are found on the Alps and Pyrenees, as well as on Olympus, and other lofty mountains, but are not to be met with any where else. When these mountain vegetables are transplanted into gardens, they grow to a larger size, but bear less fruit. Most of the plants that flourish in high northern latitudes are fond of snow, and will not thrive without it.

Thus in the garden of Nature no place is entirely barren. From the finest dust to the hardest rock, from the hottest climate under the Line to the coldest beneath the Pole, each produces plants peculiar to itself. No season is entirely destitute of flowers and fruits.—Grant, O gracious Creator, that in this unpleasant season I may not ungratefully overlook the proofs of thy tender care! If I am but

attentive to thy government, I shall always find abundant occasion to acknowledge the goodness and wisdom of thy ways. Nature is never inactive or sterile: grant, O God, that, in every period of my life, I may resemble her in this respect. If thou hast decreed me length of days, give me grace that the winter of life may not be totally destitute of charms, or utility for my fellow-creatures.

DECEMBER 7.

EXHORTATION TO REMEMBER THE INDIGENT IN WINTER.

You, my brethren, who are sitting at your ease in comfortable apartments, and hear the chilling north wind whistling round your dwellings, should be mindful of the children of poverty who are suffering in an equal degree from penury and cold. How fortunate is your condition, ye, who in this inclement season, are so well protected from its severity. You have a house to shelter you, and clothes to keep you warm; abundance of wholesome nourishment, and wine to cheer your spirits. On your soft couches sleep closes your eyes, and pleasing dreams visit your slumbers. How wretched, on the contrary, is the lot of those to whom poverty denies the comforts of life; those houseless wanderers who have no apparel to defend their shivering limbs from the piercing blast; whom delicacy forbids to ask the boon of charity; whom disease extends upon their hard pallet, with scarcely a rag to cover them.

I wish to awaken in your hearts a lively sense of the miseries to which the lower classes of your fellow

creatures are subject. Look round, and consider those objects of compassion which are in your immediate neighbourhood. How many poor creatures crawl along the streets, oppressed with cold and hunger! How many men, venerable for their years, with scarcely rags sufficient to cover their shivering limbs, expose themselves for hours in the public ways, to the inclemency of the season, soliciting the precarious charity of the passenger! How many wretched beings, laboring under disease, are extended on a miserable bed, without nourishment or medicine, in hovels which afford admittance to the cutting winds, the rains, and snow of winter.

Winter, by increasing the wants of the poor, renders our charity to them the more necessary. Is not this the season of the greatest poverty of Nature? And is not the value of our benefactions enhanced by a seasonable distribution of them? Have not summer and autumn enriched us with the productions of the field and garden, that now, during the repose of Nature, we might supply the necessities of our fellow-creatures from our stores? As the severity of the cold increases, should we not be the more ready to relieve the needy with a portion of those abundant blessings which summer conferred upon us? What other object can Providence have in view in this arrangement of things, than to excite the benevolence of the affluent by the affecting spectacle of the miseries of the indigent? Take pity, then, on your fellow-creatures who have been less highly favored than yourselves, and suffer them no longer to be more wretched than the brutes. It is your duty to alleviate their condition, and Providence itself allows you to participate in this honor.

Exhortation to remember the poor in winter.

Fulfil, then, your vocation, to feed, to clothe, to warm, to comfort the needy, to soothe their afflictions, and to snatch them from the already outstretched arm of death. Give them a portion of your superfluity, or of your competence; recollect that none can be too poor to do good; and enjoy the delightful gratification of a generous heart, the exquisite pleasure of providing for the wants of your fellow-men, of tempering for them the rigors of winter and the keenness of adversity. Who could deny himself the satisfaction of raising a human creature from the depths of misery; and how easily may this satisfaction be procured! A very small retrenchment of our expences in our clothes, tables, and pleasures, would be sufficient for this purpose. And what more grateful sacrifice can we offer to virtue, than when our benevolence is the result of a victory over our own passions; when we refrain from the gratification of pomp and pride, that we may devote the sums which it would cost us to the relief of the poor!

I will strive, then, as much as possible to alleviate the wretchedness of my fellow-creatures in these days of winter. Amidst the conveniencies which I enjoy, I will not be unmindful of the condition of those who are obliged to dispense with most of the comforts of life. The comparison of their situation with mine will make me the more deeply sensible of my own happiness, and will excite me to praise so much the more fervently that God who has conferred his favors upon me in preference to so many thousands of my fellow-creatures. If I, then, follow the impulse of an uncorrupted heart, I shall be ready to make others happy, or, at least, to alleviate their condition as far as

lies in my power. I will ask myself what comforts I wish for in this inclement season; and what I should desire to enjoy myself, I will endeavor to procure for my needy brethren. Perhaps I may know some who have not sufficient clothing to skreen themselves from the effects of the cold. To their use, then, will I devote such of my garments as are subservient only to the purposes of empty vanity. I repose upon a soft bed; should I be less unhappy if I exchanged it for a harder, in order to procure sweeter slumbers for an indigent fellow-creature? I enjoy the refreshing warmth of a good fire. Shall I, then, suffer so many to shiver with cold around me? In a word, I will conduct myself towards all those who stand in need of relief, in the manner which I shall think best adapted to soothe their afflictions and to mitigate their distresses.

DECEMBER 8.

NATURE A SCHOOL FOR THE HEART.

By the contemplation of Nature our hearts are gainers in every respect. Nature may justly be denominated a school for the heart, because it teaches us, in the most explicit manner, the duties which we owe to God, to ourselves, and to our fellow-creatures.

Can any thing inspire us with a more profound veneration for God, than the reflection that it was he who not only created the prodigious globe of the earth from nothing, but who likewise suspended it in the vast regions of space, with all the creatures which it contains; that it is he whose mighty hand retains the sun in his orbit, and the ocean within its con-

fines? Can I be sufficiently humble in the presence of a Being who created the innumerable worlds which revolve in the heavens above our heads? What an insignificant creature am I, in comparison of those prodigious bodies! Considered in this point of view, how mean, how contemptible is this earth, with all its glory! How careful ought I to be not to offend that God, whose omnipotence is every where manifested; whose very look can destroy me, and render me the most miserable of creatures! At the same time the contemplation of Nature is calculated to excite the strongest emotions of love and gratitude. All Nature loudly proclaims that God is love. It was love that induced the Almighty to manifest his glory by the creation of the world, and to communicate to other beings some portion of the felicity which he himself enjoyed. He therefore created the universe, and an innumerable multitude of creatures, that each, from the resplendent archangel to the meanest insect, might, according to its nature and capacity, experience the effects of divine goodness. And where is the creature that does not afford a demonstration of this truth? But what particular proofs of the divine goodness may I not discover in myself! He has endowed me with reason, that I might not only enjoy his benefits, but also be enabled to feel and to acknowledge that love which is the source of all the blessings he confers, and thus doubly rejoice in his favors. He hath given me the dominion over all animals, that I might make them subservient to my use and convenience; and for me the earth brings forth fruit in such abundance. And ought not all the benefits which I daily enjoy, and on which my existence depends;

ought not love so disinterested as that of my Creator, who cannot receive any thing of his creatures, and whose felicity is susceptible of no addition,—ought not all this to call forth my warmest gratitude, and kindle in my heart the most ardent love towards the giver of so many good things? Finally, my confidence in God is strengthened by the contemplation of the world and of the divine perfections. How happy ought I to be, knowing that my fate is in the hands of that Being, of whose omnipotence, wisdom, and goodness I have as many proofs as there are creatures before my eyes! Can I possibly wish for any thing that might contribute to my real happiness, which God, whose power created so many worlds from nought, is not able to give me? Can I be involved in any embarrassment, from which that wisdom which stretched out the heavens, and has so admirably formed all living creatures, could not extricate me? What should prevent me from having recourse to him in every danger and under every difficulty, and cherishing the confident hope that he will listen to my prayers?

It appears scarcely possible that mean and selfish principles can find their way into the heart of that man who is accustomed to contemplate in Nature the sublime attributes of the Deity, who has in view the happiness of each particular individual, as well as the general welfare of the universe. A superficial observation of the government of the universe and of Nature, must thoroughly convince every one of the general care and loving kindness of the Creator for all the works of his hand; and that heart must be exceedingly depraved, in which this conviction does not produce a desire to imitate this universal beneficence of our God. Is it not

perfectly natural, that, after the divine example, I should manifest an universal good-will towards my fellow-creatures? God maketh his sun to rise on the evil and on the good, and sendeth rain on the just and on the unjust: how, then, can I make invidious distinctions in the distribution of my benefactions? With impartial tenderness God extends his care to the poor as well as to the rich. If I am desirous of treading in his steps, ought I not to cherish in my heart love equally liberal and disinterested?

Finally, what sentiments must the consideration of the order that prevails throughout all Nature awaken in my soul! If I am convinced that nothing but order can be pleasing to God, shall I not seriously endeavor to conform myself to that general order which he has established? How I should abhor myself, if I were conscious that through my own fault I had occasioned any derangement in the admirable plan of the universe! How necessary is it, then, that I should endeavor to second the views of my Maker, who wishes me to attain all the perfection of which I am susceptible, and to that end avail myself of all the means presented to me by Nature and by grace! Be this henceforth my chief occupation! As long as I discover any disorder, any irregularity within me, I will not cease my efforts to amend myself, and to aid the salutary operations of the Holy Spirit of God.

What an excellent school, then, is Nature for the heart. In this school I will be a pupil, and carry with me a docile and attentive mind. Here will I learn wisdom; that wisdom which is never accompanied with disgust. Here will I learn to know God; and in this blessed knowledge I shall

Apparent evils are often real benefits.

enjoy a foretaste of heaven. Amid these occupations, the days of this mortal life will glide smoothly away, till I shall be permitted to enter that world, where all the mysteries of Nature and of grace shall be clearly displayed to my view.

DECEMBER 9.

APPARENT EVILS ARE OFTEN REAL BENEFITS.

THE generality of mankind are inclined to wish that they were not exposed to any evils. If they had the power of chusing their condition, and of regulating at pleasure the circumstances of their lives, they would endeavor to secure a state that should be exempt from all kinds of difficulties and afflictions. But should we be really happy if nothing ever happened that could in any way disturb our tranquillity, or interrupt our prosperity; or if our lives were not chequered by the vicissitudes of pleasing and painful events? This question, on the decision of which depends much of our happiness in this stage of existence, deserves an attentive investigation; in which, however, the illusions of self-love should not be allowed to interfere.

Should we, then, be really happy, were we to enjoy in this world uninterrupted prosperity? I cannot think we should. Continual prosperity would soon become insipid; and disgust would soon convert our felicity into actual misery. The evils, on the contrary, which we sometimes experience, enhance the value of the pleasures we enjoy; as colors are heightened by the contrast of shades. How should we be able to appreciate the

charms of spring without winter, the value of health without sickness, the sweets of repose without the fatigues of labor, the consolation of a good conscience without temptations? The more numerous the obstacles that oppose our happiness, the more sincere is our satisfaction when we have at length surmounted them. The keener the woes we are obliged to endure, the greater is our felicity, which, when they are past, often presses tears of joy from our eyes.

To go even still farther, it may be affirmed, that, were it not for the inconveniencies of which we complain, we should be exposed to evils of much greater magnitude. Had we one uninterrupted tide of prosperity, we should give way to pride, voluptuousness, and ambition. If we never knew the pressure of want, no one would take the trouble to be industrious in his vocation: no one would cultivate his faculties or exercise his understanding; no one would be animated with zeal for the public good. Were we never in danger, how could we acquire prudence, or learn to feel compassion for those whose lives are exposed to perils? Had we no misfortunes to fear, how liable should we be to forget, in the intoxication of our prosperity, the gratitude we owe to God, the love we are enjoined to cherish for our neighbor, and all our other duties? And are not all these virtues infinitely preferable to the incessant serenity arising from the enjoyment of continual prosperity, the uninterrupted duration of which would in the end produce satiety and disgust? He who reposes undisturbed in the lap of prosperity, is lulled into a state of indolence unfavorable for efforts of virtue; but he who

Apparent evils are often real benefits.

smarts beneath the strokes of adversity is rendered active, wise, and virtuous in the school of that salutary monitor.

How absurd are the desires of men! They wish to enjoy tranquillity, comfort, and happiness, and yet they are dissatisfied with the means by which they are to be acquired. During the heats of summer we sigh for cooler weather, and yet see with apprehension the gathering storm coming to accomplish our wishes. Lightning purifies the air and fertilizes the earth; but is not designed to fill us with terror. We are ready to acknowledge the utility of coal, sulphur, minerals, and mineral waters, but we would not have any earthquakes. We are desirous that there should be no epidemic diseases, and yet complain when tempests supervene to purify the atmosphere. We wish for servants to attend us, and yet would have in the world no poverty, no inequality of ranks. We would afford incitements to virtue, and yet would deny the superiority of the virtuous to the wicked, since we desire that human life should be exempt from misfortunes and from chastisements.

Acknowledge then, O man, the wise and beneficent intentions of thy God, even when he permits thee to be tried by the vicissitudes of joy and sorrow, of prosperity and adversity. Is he not the arbiter of thy destiny, on whose will it alone depends to crown thee with happiness, or to overwhelm thee with misery? Is he not thy Father, on whose tenderness thou mayst rely, even when he finds it necessary to inflict chastisements? Art thou not placed in a world, the peculiar characteristic of which is, to be subject to incessant variations? And hast thou not already often experienced in the

course of thy life, that what thy ignorance mistook for a misfortune, has essentially contributed to thy real happiness? Receive with tranquil resignation from the hand of thy God all the afflictions which he may be pleased to dispense. They will appear formidable only at first; the more thou art exercised in them, the more supportable they will be, and the more thou wilt be convinced of their salutary effects. If thou endure every untoward event with patience and hope, thou wilt ultimately be enabled to bless God for the trials which he has thought fit to send. In eternity, at least, they will call forth thy gratitude. There thou wilt form a very different judgment of the afflictions which thou here encounterest. Thou wilt then perceive, that, hadst thou not experienced these sorrows, thou wouldst not have attained that happiness which thou wast destined to enjoy. There thy woes and thy complaints will for ever cease. There, transported with joy and gratitude, thou wilt chant hymns of praise to thy God for the trials which thou hast had to endure. There, rapt in holy extacy, thou wilt cry: "The work of salvation is accomplished. The Lord hath done great things for me!"

DECEMBER 10.

ACCIDENTAL REVOLUTIONS OF THE GLOBE.

NATURE of herself is daily producing on the surface of the earth such revolutions as have a considerable influence upon the whole globe. It may be proved, from a variety of circumstances, that in many places the surface of the earth sinks here more slowly, and there more rapidly. The wall

which the Romans erected in the second century across Scotland, from sea to sea, is now almost entirely buried in the ground, and relics of it are from time to time discovered. Mountains, the pillars of the earth, are themselves liable to similar destructions, occasioned either by the sinking of the earth, by the undermining of water, or by subterraneous fire: but as some places sink, so others are elevated. A fertile valley may, in the course of a century, be converted into a morass, in which mud, turf, and other substances may form strata one above another. Gulphs and lakes may be transformed into dry land. Stagnant waters frequently produce great quantities of aquatic plants; both vegetable and animal substances putrefy in them, till at length the bottom is so much raised, and rendered so solid by means of the plants, that the place of the water is occupied by dry land.

Subterraneous fire produces many tremendous alterations on the surface of the earth. Its effects are manifested by three different kinds of commotions, all of which are sometimes observed at once. The first consists of horizontal undulations of the surface. When they are violent and unequal, the earth is shaken, and all the buildings upon it are destroyed. This kind of motion is imparted with still greater facility to water. Sometimes the motion proceeds from below, upward, in a vertical direction, and produces new islands. The surface of the earth is elevated in some places, and sinks to a great depth in others, forming new lakes, streams, and morasses. Sometimes an explosion like that of a mine, and accompanied with the eruption of ignited matters, likewise takes place. These vio-

lent convulsions produce great alterations on the surface of our globe. The sea partakes of these commotions; but new islands are their only visible results. They are formed either by the elevation of the bottom of the sea, or by extraordinary accumulations of the ignited matters projected by the volcano. Nay, we are informed by history, that by earthquakes occasioned by subterraneous fire, large cities have been buried to the depth of sixty feet, and that the husbandman afterwards sowed and reaped over them.

The motion of the waters occasions many alterations on the face of our globe. The rains which descend upon the mountains are continually washing away a portion of their substance, and carrying into the seas and rivers a prodigious quantity of earth, which produces a considerable elevation of their beds. The currents of streams are often changed; nay, the very ocean itself shifts its shores. Many places once situated on the sea-coast, are now at a great distance from it. The anchors, rings, and wreck of ships found upon mountains, and in morasses remote from the sea, incontestably prove that many parts of the dry land were once covered by the ocean. But the sea, on the other hand, has in many places made encroachments. In all probability England was at some distant period united to France. The mutual conformity of the rocks on each side of the channel, in regard to position, height, and substance, give considerable weight to this conjecture. The climate also produces great revolutions on the surface of the globe. Between the tropics, and in their vicinity, heat and rain alternately succeed each other. In some places it rains for several months

together, and at other times the heat is excessive. The countries situated near the poles are subject to great changes from the rigor of the cold. In autumn, water penetrates by numerous crevices into the mountains. In winter it is converted into ice, and by its dilatation in that state occasions great convulsions. On the coasts, and on the summits of the highest mountains, the ice and snow annually accumulate to such a degree that they never melt.

These revolutions, which are produced by accidental circumstances on the surface of the earth, are an evident demonstration of the perishable nature of our globe, but at the same time they afford an irrefragable proof that God is not an inactive spectator of these changes, but that he directs and governs them all by laws infinitely wise. For the rest, the consideration of this subject convinces me of the changeable nature of all terrestrial things, and shews me that accidental revolutions often give a new appearance to the animated, as well as to the inanimate world. One generation makes room for another. Among men, some ascend the ladder of life, while others are descending. Some exalt themselves to honor and power, while others sink into poverty and contempt. Numberless migrations and metamorphoses take place among animals. God hath assigned to all creatures different periods of duration. To some he hath given a brief and momentary existence; others he hath destined for a longer life; and others, again, for endless duration: and in all these arrangements the divine wisdom, power, and goodness are most strikingly manifested.

DECEMBER 11.

GRATITUDE FOR CLOTHING.

THE kind providence of God towards us is displayed even in our clothing. How many animals give us their skin, their hair, and their fur for a covering! The sheep alone, by its wool, furnishes us with one of the most necessary articles for our apparel: and for our silks we are indebted to the labors of a worm. How numerous, also, are the plants that contribute to our dress! Flax and hemp supply us with linen; and with the produce of the cotton-tree numberless kinds of stuff are manufactured. But these vast stores, which Nature hath provided for our clothing, would have been of no use, had not God endowed man with industry, and a mind inexhaustibly fertile in inventions, and also given him hands suitable to the preparation of the different kinds of stuffs for our apparel. Let us reflect only on the labor requisite for the making of linen, and how many hands must be set to work before we can procure a single shirt. So much the less reason, then, have we to be proud of our clothes, since we are supplied with them by animals the most contemptible in our estimation, and by the very lowest classes of men.

But why has the Creator imposed upon us the necessity of providing ourselves with clothing, while all the other animals receive theirs immediately from Nature? This arrangement is perfectly adapted to the nature of man, being on the one hand favorable to our health, and on the other suitable to our way of living. By means of it we can regulate our dress according to the seasons, according to the

climate in which we live, and the nature of our avocations. Our clothes promote the insensible perspiration, so essential for the preservation of our lives; the necessity of procuring them has exercised the ingenuity of man; has given rise to several arts, and affords employment and subsistence to a great number of persons. We have, therefore, every reason to be satisfied with this dispensation of Providence; only let us take care not to lose sight of the end proposed in our clothing. A Christian should not seek to derive glory from the external covering of his body, but from the noble qualities of the soul. Pride assumes various forms: it piques itself internally on the most frivolous things; arrogates a superiority which it does not possess, or attaches an extravagant value to the advantages which it actually enjoys. Externally it is manifested by silk, gold, and precious stones; and in others by mean attire, and even by rags. Both these extremes are shunned by the Christian; for it is in the highest degree degrading to human nature to glory in the apparel and ornament of the body. We wear clothes to protect ourselves from the influence of the weather, which, in the present feeble state of our nature since the fall, would destroy our health, to conceal our nakedness, and to make a distinction between the sexes, and the different ranks in civil society. Such are the rational ends for which clothes were designed, and we ought to use them only as far as is necessary for the accomplishment of these objects.

Let us now, my brethren, bestow a thought on that portion of our fellow-creatures who have scarcely sufficient clothes to cover themselves. Ah! how many half naked wretches do we see around us

in these days of winter—how many who are utterly incapable of protecting themselves from the severity of the frost! Let the sight of these unfortunate creatures impress us with a profound sense of our own good-fortune in being able to purchase the clothing we stand in need of. Many of those who read these lines possess two, three, or more suits; but let them recollect that around them are many hundreds who find it difficult to procure a single one, and that it is their duty to clothe the naked, and to receive with grateful hearts the abundant provision which God has made for them.

Accept my fervent gratitude, O my Preserver, for the benefits thou hast conferred upon me in respect to clothing. Thou hast not only given me those garments which were absolutely necessary, but such as were comfortable, decent, nay, even elegant. Blessed be thy paternal goodness! Teach me so to watch over my heart, that I may never harbor vanity on account of my dress. Instruct me to unite decency with humility, to take delight in clothing the poor, and in renouncing every species of superfluity for my own person. Teach me to strive only to adorn my soul with virtue, since that alone possesses any real value in thy sight. Soon shall I want no other covering than a winding-sheet; but while I have occasion for more, deign to grant it me, especially when my hands, enfeebled by age, shall be unfit for my usual occupations.

O my Father, thou who best knowest what I stand in need of; into the hands of thy Providence, which so powerfully supports the weak, I commit myself. Content, I will follow whithersoever thou leadest, and implore thee to strengthen my confidence and attachment.

DECEMBER 12.

OF THE CLOTHING OF ANIMALS.

It is an admirable arrangement of divine Providence, that all the irrational animals are naturally furnished with such a covering as is best adapted to their place of abode and their way of life. Some are clothed with hair, others with feathers; some with scales, and others with shells. It is evident that a skilful workman has prepared the garments of the animals, for they are not only generally adapted to the species, but to each particular part of the body. For quadrupeds hair is the most suitable covering; and this, together with the texture of their skin, enables them to lie upon the bare ground in all weathers, and renders them fit to be employed in the service of man. The thick fur of some animals not only protects them from wet and cold, but likewise serves for a warm covering, and a soft bed for their tender young. For birds and certain species of insects, feathers are a very commodious covering. Besides affording shelter from cold and wet, they are extremely convenient for the motion of those animals through the air. To this end they are distributed over the whole body, and their structure is so delicate as to favor the flight of the bird. The coarser part is firm and compact enough to keep the animal warm, to protect it from injury from the weather, and to give the wings a due degree of strength. The covering of reptiles is perfectly adapted to their way of life. Let us, for instance, examine the earth-worm. Its whole body is composed of small rings, and these rings are provided with a certain number of mus-

cles, by means of which they can extend or contract their bodies at pleasure. Under the skin they have a glutinous juice, which they can discharge, to lubricate the body, and enable it with the greater facility to make its way through the earth: a mode of life which they could not follow, if they were covered with hair, feathers, or scales. The covering of aquatic animals is manifestly adapted to the nature of the element in which they live. Fishes could not have a more convenient external covering than scales, which are of a horny substance, and the figure, hardness, size, number, and position of which are exactly suited to their mode of life. And with respect to the shell-fish, could they possibly have a more convenient defence than that which the Creator has assigned them?

The extraordinary beauty of all these various kinds of covering is truly remarkable. Even the most loathsome and disagreeable animals possess a beauty peculiar to themselves; but a great portion of the birds and insects have been particularly distinguished by the Creator for the splendor of their clothing. Look only at the butterflies; their beauty is astonishing. Some are dressed very plain: their color is uniform and simple; some are adorned, but yet with frugality; while others are profusely decked with the most brilliant colors. How beautifully is their clothing striped in many places, how charmingly spotted and studded in others! Now examine these beauties through the microscope. Could any one have ever imagined that the wings of the butterfly are covered with feathers? Yet such is actually the case. The substance which we call dust is in fact nothing but feathers, which are arranged with astonishing regularity. Their position

is as geometrically exact as their colors are resplendent. The middle part of these little feathers, which is attached to the wings, is the strongest, but the exterior is much softer, and extremely delicate, What manifold beauties are exhibited in the plumage of birds! The little Colibri, an American bird, may justly be regarded, on this account, as one of the wonders of Nature. In size it does not exceed a large fly, but its plumage is so beautiful, that its neck, bill, and wings reflect the colors of the rainbow. Its neck is red like the ruby: on the belly and under the wings it is of a gold yellow; the thighs are green as the emerald; the legs and bill black and smooth as ebony. The male has a small tuft upon his head, in which all the colors of the whole body are combined. On account of the exquisite beauty of its plumage, the ladies of Mexico wear these birds, when dead, for pendants in their ears.

We shall find that in the clothing of animals God has always kept in view convenience, utility, and beauty. Every animal has received the covering most suitable for it, and it would be defective if it had any other in its stead. In the clothing of animals, nothing is wanting, nothing is superfluous: on the contrary, all is so admirably arranged, and even the minutest parts are so perfect, as far to surpass the greatest efforts of human ingenuity, if we were to attempt an imitation of it. All these circumstances demonstrate the existence of a Being, who to infinite wisdom unites unbounded beneficence, and a desire of rendering every creature a happy as its nature and destination will permit.

DECEMBER 13.

REFLECTIONS ON THE RAVAGES OF WINTER.

I HEAR the roaring of the winds and tempests. My blood chilled by the intense cold, the gloom that bedims the day, the early departure of the light, a natural disposition to terror and alarm, all contribute to render the uproar of Nature more tremendous. How often does the wind sweep away houses and palaces, and destroy the labor of many years! How often does it hurl ships, with their crews, to the bottom of the abyss! How often does it uproot the strongest oaks! But thou, O God, art the creator and the ruler of the tempest. The winds are thy messengers, the heralds of thy power, the awful ministers of thy will. They are designed to lead us to fear and to adore thee. If thou didst not set bounds to their destructive violence, they would cause equal devastation at one and the same time all over the earth; and yet, my little unsheltered hut is still spared and suffered to stand! Thanks to thy mighty arm, which calms the turbulent billows and the tempestuous winds; thanks to thy wisdom, which has arranged all things for the best.—But, if the universe, and all the events that take place in it, be the works and the effects of infinite wisdom, how can the mischief, the disorder and desolation occasioned by tempests, ever happen? Can supreme wisdom produce any thing but order, or infinite goodness design aught but what is good?—Such may be thy thoughts, O man; but who art thou that thus scrutinizest the decrees of the Almighty? Shall the creature say to his Creator, Why hast thou made me thus? And must it neces-

sarily follow that the works of Providence are defective, because we cannot fathom the causes of all events? Are we to judge of the works and designs of our God, as though we were equal to him in wisdom and intelligence? It is truly wonderful that we are capable of perceiving so much of the order and the wisdom of his plans, and that things do not appear still more confused to our dark and disordered understandings. And, indeed, the universe would be one vast theatre of confusion and disorder, neither harmony nor happiness would be found in it, if there did not exist a Being whose wisdom, goodness, and power surpass our comprehensions, who has created the world, and arranged all that it contains. All the beauty, the blessings, and the felicity we meet with in the world, demonstrate the wisdom and the bounty of the Creator. And if the general arrangement and the ordinary course of Nature evidently tend to beneficent purposes, the apparent contradiction of certain circumstances only proves our ignorance and incapacity to form a judgment respecting them. To compose a whole out of the materials of this visible world, in which so many magnificent phenomena are produced, such multifarious beauties displayed, and which contains such treasures of knowledge, virtue, pleasure, and felicity, as we may perceive in it, is a work so admirable, so divine, that it could not have been planned, and much less executed, by any other being. The farther we proceed in our investigation of the works of Nature, the more clearly we discover that supreme wisdom and goodness have created, and still govern the whole. With this conviction you will form a very different opinion of the ravages which you ascribe to winter. The tem-

pests, the snow, the frost, and all the unpleasant phenomena of this season, are linked together in the eternal order of things; each arising from a particular cause at its appointed time; and by means of these changes, supreme wisdom preserves the harmony of the immense whole. The winds which strike terror into the soul of the mariner, waft refreshing rains to arid lands. The sulphureous vapors, the saline, and other substances, which are carried by the winds from one region to another, re-invigorate the earth, and restore fertility to the fields, covered with stubble, and exhausted by the harvest. Thus winter, apparently so destructive, communicates to the earth the power of again producing rich crops.

The earth, the gardens, and the vegetable kingdom are now buried in profound sleep beneath ice and snow. The inhabitants of the forests and the beasts of prey, pressed with hunger, howl more frightfully. The world appears inanimate; but thou, O Lord, preservest it in this state of apparent death. Thou watchest over expiring Nature. What miracles dost thou perform amidst the horrors of winter! Thou warmest and feedest the poor; and the sparrow, though deprived of its usual nourishment, still lives in its unknown retreat upon the gifts of thy bounteous hand. The earth, whose bosom is at this season shut up, affords no sustenance; but thy hand, which is never closed, giveth water and bread, and calleth into existence things which are not yet in being.

O Lord, thou art great! Even the most inclement seasons thou approvest thyself a kind preserver and protector. Thou knowest how to provide us food amidst ice and snow, and gavest to man inge-

nuity and intelligence, by which he is enabled to lighten the iron yoke of the cold. Thou clothest the naked, and strengthenest the weak: they live and prosper.—Give us such hearts that we may discover thee in all things as our God, and the general friend of mankind. Let thy bounty enkindle in our bosoms a love even for our most inveterate enemies. Even to such we should never deny the refreshment they require during the rigors of winter, neither should we withhold such consolation as we can afford them under affliction.—Let the world be governed by the immutable laws which thy wisdom has prescribed. Deign thou to reward us when we relieve the necessitous and feed the indigent. Let thy covenant last for ever. As long as the earth endures, let winter and summer, seed-time and harvest succeed each other, and let thy blessings be diffused over the world.

DECEMBER 14.

OF THE CARE WITH WHICH ANIMALS PROVIDE FOR THEIR SUBSISTENCE IN WINTER.

THERE are animals which construct store-houses for the winter, and in the time of their harvest lay up sufficient provision for six months. From this circumstance we might almost be disposed to conclude that these animals know before-hand that a season will come in which they cannot procure their customary food, and that they can calculate what quantity of provision will suffice for themselves and their families during that period. Among the insects, bees are almost the only species that lay up stores for the winter. The instinct of ces-

nomy teaches them to use their provision of honey and wax with great frugality, because they cannot collect any more after the season of flowers is past, and when they have no other means of subsisting, or materials for building, than the stores which they have previously amassed. They have likewise the sagacity to collect another kind of matter, which is necessary to secure their hives from the effects of the cold. This is a sort of glutinous cement, which they extract from bitter herbs and flowers, and with which they close every crevice in their hives. Their economy is displayed even in the most insignificant things. They suffer nothing to be wasted, carefully reserving for future occasions what they do not want for present use. Those who have observed these insects with the greatest attention, assure us, that when they in winter open a cell containing honey, and are consequently obliged to remove the waxen covering, they do not throw the latter away, but carry it into the public magazine.—Among quadrupeds, the hamster and all the different species of field-mice lay up provisions for the winter. At the time of harvest they convey grain in their mouths to their subterraneous habitations. Among birds, the magpie and jay collect acorns in autumn, and lay them up for a winter supply in hollow trees. As little as any of the animals which remain torpid during the winter would take the unnecessary trouble to provide sustenance for that season, so little would any of the animals which I have mentioned be content merely to satisfy its present wants, without at the same time collecting stores for its future subsistence.

These provident cares of animals cannot possibly be the result of reflection; for this would require a

degree of intelligence which cannot by any means be attributed to them. They are wholly engaged with the present, and with what produces an agreeable or disagreeable impression on their senses; and if the present has any reference to the future, it is without any consciousness or design on their part. How, indeed, could this instinct of animals be attributed to reflection, as they have no notion of the vicissitudes of the seasons and the nature of winter, and no conception of the measure of time, by which they might conclude when winter will arrive, and how long it will continue? It is impossible to ascribe to them the faculty of reason, ideas of the future, or the sagacity that is requisite for discovering the means best adapted to accomplish certain ends, since they all act in the same manner, without any variation. If the bees, for instance, do not cease to collect honey and wax till they have filled their magazines, or as long as the weather permits, it is not because they foresee that a time will come when they can gather no more. Such a degree of foresight cannot by any means be attributed to them. How can animals whose perceptions are purely sensual, have any notion of the future? Every thing has been arranged in such a manner, that the bees are supplied with a sufficient store of provisions, though they are incapable of deducing from reflection the necessity of collecting them. They are impelled by Nature to gather wax and honey; this occupation they pursue with unwearied assiduity during the fine weather, and when winter arrives, their magazines are replenished. These, as well as all other animals, act without reflection or design, and as it were mechanically, but yet conformably with the wisest rules

that prudence could have dictated. Being, therefore, themselves destitute of reason, it is manifest that there must be a superior intelligence which has contrived and provided for them, and whose designs they are obliged unconsciously to accomplish.

In this consists a portion of the prerogatives which man enjoys over the brute. I can represent to myself both the past and the future; I can act from reflection and design; I can, from rational motives, reject one plan and adopt another. How important it is, then, that I should make a proper use of these inestimable advantages! Knowing, as I do, the great change which awaits me, and being enabled to anticipate the winter of my life, ought I not to lay up, by means of reflection, a rich store of consolation and hope, to support me in my declining years, and smooth the passage to eternity. Nothing can be more melancholy than to see an old man, who, in his early years, has lived without care or concern about eternity, and now, when the winter of his days has arrived, finds himself reduced to the depths of indigence and distress. I will not conduct myself in so inconsiderate a manner, but, like a prudent housekeeper, make a provision for the future, and adopt such measures as cannot fail to lead to the enjoyment of happiness.

DECEMBER 15.

BENEFITS OF WINTER.

CONSIDER, O Christian, the benefits which the Lord confers on you in this season. The cold and frost retain many noxious vapors in the superior regions of the atmosphere, and have even the effect

of purifying the air. In many cases they are not prejudicial to the health of man, but tend to strengthen and to improve it. They preserve the humors from that putrefaction which continual heat would not fail to produce. If the exhalations and vapors collected in the atmosphere were always to descend in rain, the earth would not only become too wet and too soft, but the fluids of the human body would be increased, and its different parts would be too much dilated: whereas, on the contrary, cold operates as a bracer, and promotes the circulation of the blood. In hot countries, and in those which in winter are extremely damp and wet, dangerous and fatal diseases are much more frequent than in other places. Travellers inform us, that in the inclement region of Greenland, where the land is covered with mountains of ice, and where in winter the day is not more than four or five hours long, the air is uncommonly healthy, pure, and light; and that, excepting some complaints of the chest and eyes, occasioned partly by the nature of the food and the reflection of the snow, the diseases common in Europe are seldom heard of. We know, moreover, that God hath adapted the constitution of the inhabitants of the earth to the climates in which they live, so that those who dwell in the northern regions are fitted by Nature to endure the excessive cold which prevails there. As man, though impelled by a certain innate propensity to action, motion, and employment, nevertheless feels disposed every night to suspend his labor, to resign himself into the arms of sleep, and consequently to pass into a very different state from that in which he was before; so also some unknown power prepares us for the

changes of the seasons, and makes us as well pleased with them as if they were essentially requisite for our happiness and well-being.

Behold, O man, thy fields and thy gardens: they are buried with snow and repose beneath this covering. But this same covering is necessary to keep them warm, and secures the plants and seeds from the ravages of the frost and the impetuosity of the winds. They require some repose, being incapable of furnishing an incessant supply to the insatiable avarice of man. It is not till summer that they furnish those fruits with which he is enabled to make a provision for the whole winter. Acknowledge, then, in this dispensation the bounty and the wisdom of God! Had he not provided for thy present subsistence, hadst thou been obliged to procure it from the earth, then, indeed, thou wouldst have had some reason to complain; but he first filled thy store-houses, and thou enjoyest his blessings with a degree of repose adapted to the inclemency of the season.

How tender is the care of Providence for us during the winter. God hath endued men with sagacity to defend themselves against frost and cold. Their spirit of invention has enabled them to produce an artificial heat, by means of which they can enjoy in their apartments a degree of warmth equal to that of summer. In many countries the forests furnish the inhabitants with the means of effecting this. The care of Providence is manifested no less in the annual production of wood than in the fertility of our fields. Man has, moreover, in this season, a multitude of assistants and servants which contribute to his comfort. The colder the country, the more numerous are the animals whose furs are

capable of keeping us warm. Is not this a proof that divine wisdom foresaw the wants of every region, and provided for them by placing in each such animals as could not live in any other climate? Our beasts of burden transport for us the provisions which we stand in need of; and it is worthy of remark, that the fecundity of our cattle is greatest at this season of the year, when we have most occasion for it.

The commerce and occupations of men are not injured by the winter. The sea is converted into a solid mass, and its surface covered with snow, facilitates the communication, and strengthens the ties that subsist between men. Thus Providence hath not condemned them to listless inactivity during this season, but hath furnished them with a thousand ways of employing themselves usefully in domestic life. The repose of Nature causes man to seek resources in his own mind. The eye is no longer delighted by the charms of the creation, but the mind enjoys so much the more liberty to abandon itself to its own reflections, even amidst darkness and night. Here he may meditate on the mutability and revolutions of all terrestrial things; and form the firm resolution to devote himself to the service of that God who knoweth no change, and to make a due preparation for eternity. Here he has abundant leisure and opportunity to examine his heart, and to cultivate a disposition for good works. Happy will it be for us if we make such a salutary use of this season! If in winter there are no treasures of Nature to collect, no new harvests to reap, it will, at least, contribute to our felicity, if it affords us an opportunity of improving our minds, and doing good to our neighbors. We have

abundant occasion, even in this season, to cultivate the fear of God, to exercise our gratitude, and to strengthen our confidence in him.

Enjoying, as we do, these undeniable blessings of the Almighty, it would be the height of ingratitude if we were to regard only the inconveniencies of winter, and not to consider, on the other hand, the advantages by which they are more than counterbalanced. Let us, then, make it our duty to acquire more rational sentiments on this subject, and to refrain from inconsiderate murmurs. If but one of my readers should be excited to acknowledge the goodness of the Lord, and with a grateful heart to adore him for all his benefits, I shall think myself amply rewarded for these reflections.

DECEMBER 16.

THE ELEMENTS.

WHETHER we consider the universe in general, or examine its individual parts, we shall find abundant cause to admire the omnipotence and the wisdom of God. In most cases, indeed, our limited understanding can advance no farther than conjectures; but even these conjectures are sufficient to convince us of the greatness of our Creator on the one hand, and of the weakness of our reason on the other. Perhaps all the elements are but one substance, so incorporated with each other as to form but one whole: but our understanding is not capable of conceiving this conjunction of the elements. We are obliged to divide them in idea, and to consider the primitive constituent parts of Nature.

How various and wonderful are the properties of

the air which I every moment respire! What else has such power to dissolve all kinds of substances, and at the same time to assume all their different properties? Numberless kinds of vapors and exhalations, thousands of different odors, the many volatile salts, alkaline and acid, the oils and inflammable gases, which unite and commix with it, sometimes render it pernicious, but in general salubrious and beneficial. The multitude of foreign particles contained in the air, and the property it possesses of compression or dilatation, produce the most salutary changes, by which noxious vapors are dispersed, the earth is purified, and the vegetation of plants is promoted. And though the phenomena of the atmosphere are sometimes terrific and destructive, they are, however, indispensably necessary to prevent the earth from being converted into a desert. In this element, as in all the works of the Lord, there are impenetrable mysteries. How astonishing, for instance, that the particles of air should be so subtle as to elude our sight, and yet be a medium of rendering objects visible to us! How wonderful the equilibrium that subsists between the external air and that within our bodies! How extraordinary that one and the same element, which operates with such excessive rapidity, should transmit to us sound, smell, and light.

Water has many conformities with air. Its properties, effects, and phenomena are not less various and admirable. How many different virtues hath God imparted to this element! Without water we must inevitably perish, notwithstanding all the abundance and salubrity of the air, all the riches of the earth, and all the warmth of fire. Of what wonderful changes and combinations it is suscepti-

ble! Who hath given it such expansibility, and rendered it capable of being divided into parts so extremely minute, that they can ascend into the atmosphere to the height of some miles, and float there when collected into the form of fogs and clouds? Who hath given it the power to penetrate into plants, to pass out of them again by perspiration, and to descend upon our fields in refreshing dews! How astonishing are the properties which it has of sometimes becoming lighter than the air, though a given quantity of water is almost nine hundred times as heavy as the same quantity of air; and of recovering its former gravity, adhering to all bodies, dissolving the most solid substances, and even of uniting with fire!

Of all the elements, fire is that with whose nature we are least acquainted, because it is too subtle for our imperfect sight. Its power, properties, and effects are, however, sufficiently obvious. Whether fire be merely a particular kind of motion, or whether, as the result of numerous experiments would lead us to suspect, it be a matter which differs in its nature from all other corporeal things; so much is certain, that its universality, its properties, and numberless phenomena are calculated to excite the highest astonishment. No substance is so cold as not to contain some particles of caloric, the presence of which is clearly perceptible when they are elicited by violent motion or friction. Fire exists in the air which we breathe, in the water that we drink, and in the earth upon which we live. What power must it possess, to penetrate the minutest pores of bodies, to combine with them, to move with them from one place to another, and though enveloped in them, yet to continue perceptible to

the eye and to the touch! How great must be its force, to expand the air by which it is surrounded, and at the same time to acquire new energy and vigor by means of the air which is propelled from it! This element gives fluidity to water, fertility to the earth, and health and life to animals and to man.

Earth, when pure, is distinguished from all other bodies by having neither taste nor smell; by being insoluble in water or spirit of wine; and by the facility with which it crumbles between the fingers. It appears to be very different from other elements; but yet the resemblance is so great, that some natural philosophers have maintained that water is nothing but earth in a state of solution, and others that earth is water thickened and condensed. The latter assert, that the water of our globe is continually diminishing, because it is gradually incorporated into solid bodies; for accurate investigations prove that every thing was at one time a kind of pulp, and at a still earlier period, water.

Let me consider whichsoever I will of these elements, whose influence is so essentially necessary for my existence, I am filled with the highest astonishment at the manifold properties that distinguish it, and the innumerable phenomena which they produce. How many properties, each differing from the other, hath God communicated to all the works of his hand, small as well as great! How many agents, in the heavens and upon earth, are continually in motion for the preservation of the universe in general, and every individual object in particular! What amazing phenomena of Nature result only from the combination of the elements with each other! It would be easier to number all

the creatures of God, than that of the powers which are incessantly in action. How great, then, must be that power from which all these energies proceed. All of them are dependent on thy will, O Creator, all-powerful and all-wise! Thou gavest them all existence, and hast communicated to them all an everlasting, simple, and salutary motion. Thou knowest how to maintain such an equilibrium among the elements, as to preserve the fabric of the universe unimpaired. Unto thee, therefore, be rendered all honor and glory, now and evermore.

DECEMBER 17.

ACTION OF THE SUN UPON THE EARTH.

THE sun is the principal cause of all the phenomena that take place on the earth. He is the constant source of the light that is so abundantly diffused over our globe. This light of the sun is the most subtle fire, which penetrates from every side into the interior of bodies, and when it is in sufficient quantity, sets all their parts in motion, attenuates and decomposes them, dissolves such as are solid, rarefies still more those which are fluid, and adapts them to an infinity of movements. Is it not obvious then, that, on the diversified effects of the sun's action on the earth and our atmosphere, must depend the grand revolutions, as well as the inferior changes which occur upon our globe? When the force of the sun's light increases, that is, when his rays fall less obliquely, and in greater quantity upon a given place, and when they act longer every day, which is the case in summer, it must effect

great changes in all the phenomena to which I have alluded, both on the surface of the earth and in the air. When the rays fall more obliquely, and are consequently more feeble, they act for a shorter period every day, as is the case in winter. How changed is then the appearance of the earth! How different are the meteors observable in our atmosphere! What a diversity between the phenomena of summer and winter! What gradual alterations are observable in all corporeal things, when the sun advances from the distant sign of Capricorn towards the equinoctial Line, till in spring the day becomes equal to the night! What new phenomena, and how different the order in which they take place when this powerful luminary returns in summer from the tropic of Cancer to the Line, till the days and nights again become equal in autumn! All these phenomena differ, because the number and obliquity of the sun's rays, and the time which he remains above our horizon in the various seasons are different. What a variety shall we perceive when we compare his visible influence on the different zones of the earth! It is from the distance of the sun that all the diversity observed in the vegetation of plants, and in the internal organization of bodies in all climates and seasons depends. Hence each climate and season has plants and animals peculiar to itself, the works of Nature are produced more or less rapidly, and continue for a longer or a shorter period.

It would, however, be impossible for man to enumerate, I will not say to describe with accuracy all the different effects of the sun upon our earth. All the revolutions of the globe are principally owing to that luminary, because upon it chiefly depend

the different degrees of heat and cold. I say chiefly, since the nature of the soil, the various mixtures which are more or less abundant in certain provinces, the mountains and hills, with their different exposures, likewise contribute, in some measure, to render a country warmer or colder, more or less subject to rain, winds, and other variations of the atmosphere. It is, nevertheless, incontestably true, that all these accessary causes are incapable of producing the phenomena which actually occur at different times in different places; for it is certain that none of these corporeal effects would take place in the manner in which they happen, if the heat of the sun were not to act in the very same degree and order in which it does really act. And if this degree and this order were to be changed, all the phenomena would likewise be altered in the same proportion.

Only consider, reader, the visible effects which cannot be ascribed to any other cause than the action of the sun. These phenomena are daily manifested. Sometimes his heat rarefies the air; at others it renders the atmosphere more dense. Sometimes it raises fogs and vapors; sometimes it precipitates them to the earth, and sometimes it compresses them for various other purposes. It causes the sap to rise in summer in trees, plants, and vegetables; it makes the leaves and blossoms to shoot forth; it transforms the latter into fruit, which it colors and brings to maturity. It vivifies all Nature; it is the source of warmth; it operates in the deepest recesses of the earth, where it produces metals and living creatures; it penetrates even into mountains and rocks, and extends also to the abysses of the ocean. This alone would be sufficient to con-

Cold rains of winter.

vince us of the omnipotence of our Creator; but when we observe with what wisdom God has distributed this influence, and with what art he has made use of the sun's heat to produce so many phenomena of Nature, we may thence perceive still more clearly the infinite wisdom of the Creator, which is combined with infinite power. Would man deserve to be lighted, to be warmed and cheered by the sun, if, in the salutary influences of that luminary, he refused to acknowledge the work of the great Creator, to admire his grandeur, his majesty, and all his glorious attributes, and to adore him with sentiments of profound awe and humble veneration.

DECEMBER 18.

COLD RAINS OF WINTER.

How different are the cold rains which are now discharged upon the earth, from the genial showers of summer, that impart freshness and beauty to all Nature! What a dreary aspect she now exhibits! The sun is concealed from our view, and the heavens appear to be but one vast cloud. The prospect is abridged on every side; all around is enveloped in gloomy obscurity, and every thing portends an approaching storm. The clouds at length discharge their burden; the atmosphere seems an inexhaustible reservoir of water; the rivers and brooks swell, and, overflowing their banks, inundate meadows and corn-fields.

This dispensation of Nature, disagreeable and unpleasant as it may appear to us, is designed for wise and salutary ends. The earth, exhausted by

Cold rains of winter.

its fecundity, requires a renovation of its strength, for which rain is as necessary as repose. Rain imparts life and force to the parched and impoverished soil; it penetrates into the deepest recesses of the earth, and to the lowest roots of vegetables. The humidity causes the withered leaves, which every where cover the ground, to rot, and form an excellent manure. The abundant rains of winter replenish the reservoirs of the rivers, and afford a fresh supply to the springs that descend from the mountains. Nature is never idle; her activity, though often concealed from our view, is nevertheless incessant. The snow and rain continually discharged by the clouds, prepare the fertility of the ensuing year, and the riches of summer. When the heat of the sun occasions drought, the springs pour forth the abundant stores collected during the rains of winter, irrigate the meadows and valleys, and heighten the beauty of the verdure with which they are clothed. Such is the wisdom with which the Creator provides for the future, that what to us appears inconvenient or destructive, proves the source of the beauty and riches which spring and summer yield in such profusion. Innumerable as the drops of rain which fall from the clouds are the blessings which God confers, by means of them, on all his creatures. If even short-sighted man murmurs on account of dispensations which ought to excite his warmest gratitude, still eternal wisdom continues with unchangeable goodness to accomplish its designs. Our preservation, then, is the principal end which God has in view in sending rains to moisten the earth. But divine wisdom knows how to combine various ends which are dependent on each other, and from the fulfilment of

Cold rains of winter.

which result the harmony and well-being of the whole. Thus the animals which exist not only for the use of man, but likewise for their own sakes, are also to be nourished by the produce of the earth. For them also the clouds discharge their showers, and renew its fertility.

In this, as in every other arrangement of Nature, we discover the wisest economy. All the vapors and all the exhalations which are daily rising from the terrestrial bodies, are preserved and collected in the atmosphere, which soon returns them to the earth, either in small drops, or in copious showers, or in light flakes, according to its necessities. All is conducted with wise frugality, and notwithstanding the abundance, there is no profusion. Even those exhalations which are imperceptible to us, are converted into new sources of fertility. But in vain would the vapors ascend and clouds be formed, if Nature had not commissioned the winds to propel the clouds according to the secret laws of wisdom, and to water those provinces which stand in need of moisture. One district would be inundated with continual rains; another would be parched with incessant drought; the trees, the grass, the corn would perish, if the winds did not drive the clouds to and fro, and assign the places on which they are to discharge their stores. God saith to the snow, be thou on the earth; likewise to the small rain and the great rain of his strength. (*Job* xxxvii. 6.)

Necessary as are the unpleasant rains of winter, and the dreary weather of the present season, so necessary it is that my life should be chequered with gloomy days. If I am to be fruitful in all good works, I cannot desire a continual sunshine of prosperity, but disagreeable days must necessarily

intervene. With resignation will I then receive them from thy hand, O my God, intreating thee to strengthen more and more my conviction of the goodness and wisdom of thy dispensations.

DECEMBER 19.

OF THE INFLUENCE ASCRIBED TO THE PLANETS AND FIXED STARS.

THE prodigious distance of the celestial bodies from our earth, and the little connection subsisting between them and our globe, render it probable that they have very little influence upon it. But the superstition of men, which seems partial to influences of this kind, has been anxious to establish other grounds of probability. They affirm that the planets and fixed stars have an influence on the earth by means of their emanations, and which agitate the terrestrial bodies and the atmosphere surrounding the earth, by impulsion and pressure. This, however, is a mistaken notion. For if the light of the sun, which is reflected by the planets, and the proper light of the stars themselves be alluded to, that will be found to be much smaller in quantity than the light conveyed to us from the moon alone. And as the light which we receive from the moon is incapable of producing any sensible effect upon the earth or the atmosphere, still less can the planets or fixed stars possess any influence upon it. Were we to suppose that some other matter emanating from those celestial bodies, descended to the earth and operated upon us, we should assume what is totally without foundation, and even absolutely false. If these emanations ac-

tually took place, they could not fail to produce evident changes in some substance or other, if they were concentrated in the focus of a burning-glass. This, however, is contradicted by experience. Hence it is evident, that either nothing is emitted by the heavenly bodies, but the faint light which we perceive, or if any other emanations proceed from them, they must be of such a nature as to pass through terrestrial bodies without effecting the slightest change in their particles. Thus the astrologers and the superstitious, who either suffer themselves to be most grossly deceived, or who wish, from interested motives, to impose upon others, deserve the utmost contempt when they tell us of the benign influence of Jupiter, the malignity of Saturn, the ingenious Mercury, the war-rouzing Mars, and the love-inspiring Venus.

Planets are not only incapable of producing the peculiar effects that astrologers have ascribed to them, but it is impossible for them to possess any influence in general. What then shall we say of the rainy Pleiades, the stormy Orion, the gloomy Hyades, the terrific fury of the setting Arcturus and of the rising Capricorn? What connection can there be between the bull or the dog-star, when concealed in the sun's rays, and the sowing of pease? Or what relation can Scorpio have with the productiveness of the ensuing harvest? If, however, we regard the rising and setting of the different constellations through which the sun passes merely as denoting the proper seasons for the different labors of agriculture, and not as the efficient causes of natural things, there can be no harm in this. In the early ages of the world, the beginning, middle, and end of each season were not marked

by the names of months, but by the rising and setting of the fixed stars in conjunction with the sun, or by their immersion in his rays, or their emersion from them. From this practice arose the vulgar opinion that these stars produced the effects which ought in reality to be ascribed to the seasons, and consequently to the sun. Orion rises in autumn and sets in winter; hence he is said to bring tempestuous weather. Orion, however, is not the occasion of it, but the autumn and winter; his rising and setting being merely a sign of those seasons. When the dog-star rises with the sun, the heat in our zone is at the highest; but that constellation is not the cause of this heat, which is occasioned by the vertical position of the sun with respect to us, because it is then the height of our summer. I say, of *our* summer, because in the opposite zone, when the dog-star rises with the sun, the intense cold of winter benumbs the animals, and covers the water with ice; so that the inhabitants of the southern regions would certainly not regard the dog-star as the cause of heat, but much rather of cold. The same observation applies to the Pleiades, which are said to bring rain, and to all the other constellations that are supposed to produce certain effects, but which in reality belong to the seasons in which these stars rise or set.

If, then, the planets and fixed stars have not the smallest power over the natural phenomena of the globe, still less can they possess any influence over human actions. The happiness and misery of individuals and of whole nations depend partly on their natural talents and passions, partly on the political constitution of states, and partly on the combination of various natural and moral causes: con-

sequently the stars can have no influence whatever upon them. If they had, we might justly doubt the empire of Providence which we ascribe to the Supreme Being; or the ruler of the universe could not be that wise, that bountiful, omnipotent, and just God, whose intelligence is unbounded. I should not wish to live in a world whose vicissitudes, whether painful or pleasing, depended on blind chance, or on the influence of the stars; for both could not fail to prove equally pernicious to my physical and moral existence. To the superstitious I will leave the science, so humiliating and so inimical to our repose, called astrology, and which is, in fact, nothing but a miserable abuse of astronomy. To me it shall ever afford the surest ground of consolation, that myself and all the vicissitudes that shall befal me are under the direction of an infinitely wise, just, and gracious Father, who regulates all the circumstances of my life, and who governs the sun, the moon, and all the constellations of heaven.

DECEMBER 20.

THE POLAR STAR.

AMONG the northern constellations, that which is situated nearest to the north pole, and is termed the little bear, is naturally the first to attract our notice. The last star of the tail is but two degrees from the pole, and is thence denominated the polar star. It may be easily distinguished from all the neighboring stars, because it seems scarcely to change its position, and is almost always observed in the same point of the heavens. Notwithstand-

ing it appears to be fixed, this star revolves round the pole, but its motion is so slow, and the circle which it describes so small, that its change of place is scarcely perceptible. This apparent fixity of situation renders the polar star an infallible guide, especially to mariners. In all ages, especially before the discovery of the compass, navigators had not a surer conductor than the polar star; and even now, since the invention of that instrument, so invaluable to seamen, this star sometimes proves, when the sky is serene, a guide on which they may rely more securely than on the magnetic needle, and which conducts them with unerring certainty to the most distant coasts.

The advantages which we derive from the polar star naturally lead me to the consideration of the benefits conferred on us by the revealed word of God, especially of the gospel. How inestimable a gift for a man tossed about on the tempestuous ocean of the world, and surrounded with the obscurity of night. Without this guide I lose my way, and am unable to find the track that leads to God and everlasting felicity. Without the word of God for my conductor, I wander to and fro, sometimes racked with fears, sometimes cheered by hope, but always in uncertainty. In the divine revelation alone I find a certain and invariable rule, by which I can pursue with courage the race that is set before me, and accomplish it with joy. Henceforth will I, therefore, follow this never-erring guide as attentively as the pilot consults the polar star, and will keep it constantly in view, that I may never go astray. By its assistance I shall at length arrive in safety in the desired port, where I shall enjoy everlasting repose and felicity.

But in the consideration of this subject, how can I forget another proof of the goodness of God, who has given us, in the situation and the courses of the stars, so sure an index of the times, places, and points of the heavens! By means of the stars, an astronomer, though in a totally unknown region, may discover where he is, and ascertain the month, day, and hour, with the same accuracy as by the inspection of the best time-piece. If we observe, for instance, that the stars arrive each day at the same point four minutes earlier than on the preceding, we know that in a month this amounts to two hours; consequently, the star which we see to-night at ten o'clock, in a certain place, will be visible to us from the same position at eight o'clock in the latter half of January. That which we now perceive at midnight exactly over our heads, will be found a year hence in the same point of the heavens. I discover in this dispensation how bountifully the Creator hath provided for all the inhabitants of the earth. How wretched would those people be who possess neither time-pieces nor charts, had they not the stars to supply that deficiency! Of these people will I think, if the advantages I enjoy should ever appear trivial to me. But how ungrateful and how foolish should I be, if subjects, which, though they do not immediately concern me, are, however, of the highest interest to the world in general, should seem unworthy of my notice.

O Father and Creator of the stars, to thee, with grateful heart, I raise my eyes. The advantage which mankind derive in this respect from the stars, is perhaps one of the most inconsiderable of those which result from the existence of the heavenly

bodies, and yet for this benefit alone we owe thee thanks and praises.

By thy hand which made all things were the heavens stretched out like tapestry, and extended for thy glory. It was thou, O God, who art enthroned in the heaven of heavens, that created the stars and the moon to give us light in the night season.

DECEMBER 21.

EFFECTS OF AIR CONFINED IN BODIES.

THE air enclosed in the interior of bodies produces the most astonishing effects. The consequences of the freezing of fluids must have fallen under the observation of every person. Congealed water generally bursts the vessels which contain it. If you fill the barrel of a gun with water, and carefully solder up all the apertures, it will burst in a few hours when the cold is severe. How surprizing is this circumstance! We know that water is rendered fluid by the caloric which pervades it, and that it must consequently assume the form of a solid body, either when deprived of the heat which it contains, or when the motion of the latter is considerably diminished. It would therefore seem that in congelation the particles of water must be condensed, and that frozen bodies ought to occupy less space than in their fluid state. The fact, however, is, that at the time of freezing, they dilate, and take up a larger space; for without this increase of volume it would be impossible for them to burst the vessels. Besides, how could ice float

Effects of air confined in bodies.

upon water, unless it occupied a more considerable space in the state of ice than in that of water?

But what cause can produce this effect? No other than the air enclosed in the interior, for it is impossible to suppose any exterior cause. Cold is not of a material nature, and, properly speaking, cannot penetrate bodies. Neither can heat be the cause of this phenomenon. The air cannot obtain access into vessels of metal or glass, which are carefully closed, and in which ice is nevertheless formed. The cause of it, then, must exist in the freezing water. It consists, indeed, of nothing but aqueous particles, and the air which they contain. The latter exists in water in its natural state, and is, in all probability, generated also during congelation. To convince ourselves of this, we need only to observe that fluid at the moment when it begins to freeze. The first pellicle of ice is scarcely formed, before the water becomes turbid, and air-bubbles are produced. This first coat of ice is often raised in the middle, and splits; the water then springs up through the cleft, and while it is running toward the sides of the vessel, it is congealed, and causes the ice to appear the highest in the middle. These effects are produced by the inclosed air, and would either not take place at all, or in a smaller degree, if the water, previous to congelation, were exhausted as much as possible of the air which it contains.

How easily may we now account for many singular phenomena. A severe frost is very injurious to vegetables. We know that in all plants circulates a sap, which becomes thicker in winter and autumn, but yet continues fluid. Very intense cold converts this sap into ice, and consequently adds considera-

bly to its volume. This cannot happen without bursting some of the fibres and vessels of the plant, and in this case the sap, when it is rarefied in spring, cannot circulate as it ought to do. It can no more be conveyed to the different parts, than the circulation of the blood can be carried on in an animal whose veins are cut. Such a plant, then, can no longer continue to thrive, and it dies, because the nourishing sap ceases to flow through its vessels. This same frost, however, which is so detrimental to plants, may prove, in certain respects, extremly beneficial to the earth. A field ploughed before the winter is better disposed to receive the autumnal rains, and to be thoroughly penetrated by them. When frost succeeds, the particles of earth dilate, and are separated from one another; and a gradual thaw in spring renders the soil lighter, and fitter to receive the influences of the sun and of the fair season.

From these observations we perceive the great force of the air; and it is necessary that it should possess this property, in order that the earth may receive from that element such important advantages. The property of rarefaction and condensation in an almost incredible degree, peculiar to the air, is the cause of the greatest changes that befal our globe. In very few cases is the force of this fluid prejudicial, and even then the evils it produces are more than counterbalanced by the advantages; but in these, as in the other phenomena of Nature, there are many circumstances which we are unable to explain. Great part of our knowledge of the nature, the properties, and the effects of air, is founded on mere conjectures, the confirmation and elucidation of which are perhaps reserved for

future ages: nay, perhaps posterity may find that our opinions on many natural phenomena have been extremely false and erroneous. How just is it, then, that we should consider with due caution and humility the works of God in Nature, and always bear in mind the weakness of our understanding, and the fallibility of our judgments and conclusions. In any other science a degree of pride may be excused, but to be puffed up on account of our knowledge of Nature betrays imbecility, folly, and want of sense.

DECEMBER 23.

MUSIC.

To music we are indebted for one of the purest and most innocent pleasures. It has the power to charm the ear, to soothe the passions, nay, even to soften the heart, and to refine its propensities. How often has music dispelled our cares, cheered our spirits, and inspired us with nobler sentiments! So agreeable and so useful an art is worthy of a more attentive consideration, and of being employed to glorify our beneficent Creator.

Whence proceeds the impression that music makes upon the ear? It is the effect of the air, which receives a certain tremulous motion, and strikes our auditory nerves in a variety of ways. When a tight cord is pulled, its figure changes; for as it is elastic, it not only returns to its former position, but vibrates on the contrary side. By these means it communicates to the surrounding air a tremulous motion, which that element farther imparts to other contiguous bodies. Thus, for in-

stance, when you play upon an organ, the strings of a lute which may happen to be near it will emit a sound. But whence comes it that some tones are high, and others low? It is not owing to the quantity of air set in motion, for a tone may be high or low, and at the same time weak or strong. Neither can it be ascribed to the velocity of the undulatory motion by which sound is propagated in the air, for a high tone is not conveyed more swiftly than one which is low. The only reason why one tone is high and another low, is the greater or less rapidity with which the vibrations of the air succeed each other. A sonorous body emits a high tone when its vibrations are quick, and a low tone when they are slow. But whence is it that certain combinations of tones produce accords, and others discords? The only difference consists in this, that in an accord the vibrations of the air often occur together, and that in a discord this happens but seldom.

But what end would be answered by the harmony of tones, if I could not distinguish it from discord? Accept then my thanks, O my God, for having so constituted the organ of hearing, that I can receive and distinguish the different impressions of sounds, both pleasing and disagreeable, and for having imparted to my soul the faculty of combining certain ideas with corporeal sensations! What a debt of gratitude do I owe thee for the numberless opportunities of enjoying pure and innocent pleasures, which thou hast conferred upon me. Filled with these sentiments, I will make music also subservient to the glorification of thy name. With melodious notes I will often raise my heart toward thee, my benefactor, and celebrate thy mercies, so conspicuously displayed in regard to man.

DECEMBER 23.

COMPARISON BETWEEN MEN AND ANIMALS.

FROM the comparison which we are about to draw between ourselves and animals, it will appear that we possess many things in common with brutes, while in others we have the advantage of them, or they of us.

The principal resemblance between men and brutes consists in their being both material. Like them we have life and organized bodies, which are begotten, born, and supported by food. Both have strength and animal spirits to enable them to fulfil the functions that are assigned them; both have voluntary motions, the free exercise of their members, senses, and sensations, combined with an imagination and a memory. By means of the senses, both experience pleasure and pain, which excite a desire of certain things, and an aversion to others. In both is implanted the natural instinct of copulating and propagating their species. Lastly, both are subject to those general corporeal accidents which result from the nature of things, the laws of motion, and the structure of their bodies. With regard to the pleasure arising from sensual gratification, brutes have several advantages over men. One of the principal is, that they have no occasion for the clothing, weapons, and conveniencies which we require; or to invent, learn, and exercise the arts necessary to procure them. They bring with them into the world clothing, arms, and instruments of defence, and if they want any thing, they need only to follow the instinct implanted in each species. This instinct, by which alone they

are guided, is perfectly sufficient for their well-being. It conducts them exactly to what they want; when they have satisfied their appetites they are quite content, and desire nothing more; they enjoy the present, without concerning themselves about the future. For it appears from circumstances that animals have not the faculty of forming any conception of their own future condition, and that of other objects. A present feeling apprizes them of their wants, and these an innate instinct teaches them to supply. They cheerfully obey it, procure what is necessary, enjoy it with satisfaction, and are happy. The thought of the morrow never embitters their pleasures, and they know no anxiety respecting their future lot. Death itself surprizes them before they can foresee and distress themselves about its approach.

In all these respects the brute is superior to man. Without industry, reflection, exercise, and instruction, he would remain in a state of continual childhood, and would scarcely be able to procure the most essential necessaries. His propensities and passions are not safe guides, and he is involved in misery if he suffers himself to be carried away by them. The pleasures of sense soon produce satiety, and satiety is often attended with disgust, and always leaves behind a desire of other kinds of enjoyment. It is reason alone that constitutes the essential difference between him and brutes, tha can supply his wants, and that gives him prerogatives which beasts cannot possibly attain. By this he is not only enabled to procure every necessary, every convenience, and every luxury, but also to multiply the pleasures of sense, and to heighten his relish for them, the more he governs his passion

by its dictates. His soul enjoys delights unknown to the brute creation; pleasures derived from science, knowledge, order, religion, and virtue, which infinitely surpass all sensual gratification, because they never retard, but promote his progress toward perfection, because they never forsake him, when his senses, impaired by disease, age, or other circumstances, are not susceptible of sensual gratification; finally, because it renders him more like God, while, on the contrary, the more he indulges sensual appetites, the more nearly they degrade him to a level with the brutes. The latter are moreover confined within a very narrow sphere of gratification; their desires are few, consequently their pleasures are uniform: man, on the contrary, can turn every thing to his advantage. He alone is continually expanding his faculties, making new discoveries, and enlarging the stores of his knowledge, without ever attaining to the limits of perfection; all other animals being, on the other hand, confined within the same narrow circle, unable to advance beyond a certain fixed point, or by application or exertion to rise above other animals of the same species.

It is reason, then, and its consequences, that alone give man a superiority over the brute; and this is the peculiar and distinguishing characteristic of man. To make use of reason to refine the pleasures of sense, and also to procure those gratifications which result from advancement in intellectual perfection, is not only befitting the nature of man, but tends to accomplish the great end for which he was created. To the attainment of this object we ought continually to direct our attention, for we

shall never be truly happy unless we aspire to that which reason points out as truly useful and good.

DECEMBER 24.

CALCULATION RESPECTING THE RESURRECTION.

How this little spot on which our city stands, will be thronged with human beings on the day of the general resurrection! How numerous, but not innumerable will be this multitude, for each individual is known to the Lord, his judge; every name is inscribed in his book, and not one of all those whose remains are consigned to the grave will be missing, for none can escape the infinite knowledge, and penetration of the Most High.

Supposing that Germany did not begin to be peopled till five hundred years after the general deluge, or about four thousand five hundred years ago, and that from the foundation of the city of Hamburg, to the day of judgment (supposing it were to happen at the present epoch) two hundred persons only have upon an average been buried there annually, the total number during that period would amount to nine hundred thousand. If then this one city should yield such a prodigious number, how great must be the produce of all Germany! If the number of inhabitants in Germany amount to twenty-four millions, we cannot reckon for Hamburg more than the three thousandth part of the whole. According to this calculation then, Germany would yield two thousand seven hundred millions. What an enormous amount! —but yet what is it when compared with the pro-

duce of the whole earth, the present number of whose inhabitants is computed at one thousand millions! Preserving the same ratio as in the preceding calculation, the total number of dead in the above-mentioned period would be eighty-seven thousand, five hundred millions. If to this sum we add those who died before the deluge, and during the next five hundred years, and who cannot make less than the fourth part of the preceding number, we shall then have a total of one hundred and nine thousand three hundred and seventy-five millions. And, lastly, if we farther add the number of people who will be alive at the day of judgment, estimating them as before at one thousand millions, the total amount will be one hundred and ten thousand three hundred and seventy-five millions.

Now give the fullest scope to the powers of your imagination and figure to yourself, as far as you are able, this incomprehensible multitude, which, on the last day shall appear before the judge of the world. How great must be that intelligence which is perfectly acquainted with every individual comprehended in this immense number; that knows all their thoughts words and deeds, that exactly remembers the hour of their birth, the duration of their life and the time manner and circumstances of their death; that can distinguish, separate and collect the scattered atoms of each, though his body may have been reduced to ashes, dissolved into millions of particles, and have undergone innumerable transformations! What a work of omnipotence will it be, to combine, to purify, to ennoble these terrestrial atoms and form them anew into spiritual and immortal bodies. God hath revealed to us, that the host of angels shall assemble the elect

from the four winds, that at the sound of the archangel's trumpet only the dead which sleep in Christ shall first arise. This enables us in some measure to conceive the possibility of such a selection. What an agreeable occupation for the ten thousand times ten thousand angels to collect their beloved brethren and to present them to Jesus! What transports will be felt by myriads of blessed spirits whom God hath taken to himself, to receive back those bodies which they quitted pale, distorted, wasted with sickness, mutilated by acts of violence, or consumed by the flames—to receive them again, I say, clothed with celestial beauty and splendor, and vigorous, light, agile and glorious as the angels! These bodies will not be as before, obstacles to the mind, but they will be in every respect adapted to the state and occupations of everlasting bliss. With what inexpressible joy I can represent to myself the astonishment of each of the elect at the sight of this wonderful transformation!

DECEMBER 25.

THOUGHTS ON THE BIRTH OF CHRIST.

WHAT sentiments of joy, gratitude and love pervade my soul on the anniversary of the birth of Christ! But at the same time how am I overwhelmed with astonishment when I reflect on the event which we this day commemorate. I behold the son of man and nevertheless my God in a state of the deepest abasement; I behold the mighty, invisible God, at whose nod heaven and earth started into existence, and will one day be annihilated, and at the same time a feeble infant clothed in flesh as

I am. What a wonderful union! The king of kings, to whom all the angelic hosts pay adoration, assumes the form of a servant, and appears a helpless babe exposed to all the afflictions incident to humanity. What astonishing humiliation! Poor, mean human nature translated to heaven and placed with Christ upon the throne of eternal glory! How marvellous the change! But have I a just conception of the magnitude of this divine favor? Ought I not to be more and more lost in amazement, the more I reflect on my own unworthiness, and the majesty of him who was sent to my relief? Here, indeed, I discover a love which infinitely surpasses all my deserts, a love at the thought of which I can do nothing but silently wonder and adore.

Great as my admiration may be, my joy and hope are not less inexpressible. In my Saviour, become man, I contemplate the cheering sign of the new covenant which God hath made with man. By this I am convinced that God is faithful to his promises, and that he sent his son into the world that I might live. And may I not then confidently hope that all which has been promised me in his name will be accomplished with the same fidelity? Jesus Christ would never have conferred such high honour on our nature, as to unite it so intimately with God, had he not resolved in his own person to heal its infirmities, to take away its frailties, to make an atonement for its faults, to wipe away its offences, and to restore it to its primitive purity and innocence. What confidence may I not then henceforward place in the love of my heavenly father! He has already given me proofs of the greatest love; any smaller favor I cannot ask of him in vain. How can he deny me any thing who for my sake gave, unsolicited,

the object that was dearest to him? And may I not likewise place implicit confidence in the Lord, who became man for me? If God is in Christ, he will assuredly accomplish all that he came into the world to do. He will trample all my enemies under his feet, he will wipe away all my iniquities, and his mighty hand will open for me the gates of heaven. If I resign myself to his direction, he will snatch me from the abyss of corruption; he will give me strength to vanquish the world and sin; he will make me a new creature that I may be holy and glorious like himself.

And what can be more natural, more just than that I should wholly resign myself on this solemn day to the sentiments of the most ardent love? Love produces love; but that love which has been shewn me by God my Saviour is of inestimable value, I cannot be repaid by any reciprocal love, however strong. But I will do as much as lies in my power; I will love him with all the fervor that his grace enables me. Then may I hope that my feeble, but sincere love will be pleasing unto him. The love to Jesus shall excite me to find in him my highest felicity; and the meditation on his mercies shall be my favorite occupation. I will seek nothing with such ardor as the uninterrupted communion by faith with him. Full of zeal I will strive to purify my soul of every thing that can be displeasing to my Redeemer. To him will I consecrate my life, and gain his favor by the willing compliance with all his injunctions. O my Saviour, to thee will I devote myself; to thee will I sacrifice all my passions and all my desires. Beside thy manger I will learn to renounce all pride and to endure as cheerfully as thou didst every inconvenience for the benefit of others.

Such, O christian, are the sentiments with which it, is thy duty to celebrate the anniversary of the birth of Jesus. But each of them ought to result from a lively conviction of many other truths, and to be accompanied with many other emotions. Let not thy admiration be the offspring of ignorance but of enlightened persuasion. Meditate, then, with diligence on the wonders of the grace of God, if not to fathom their depth, at least to convince thyself of their nature and certainty. And if the divine majesty and supreme intelligence overwhelmed thee with astonishment, let them also excite in thy heart a profound veneration for him who dwelleth in the heaven of heavens, and to a humble sense of thine own imbecility. But beware lest thy hope be the effect of blind persuasion. If it be the result of true faith, what sweet consolation, what celestial joy will it pour into thy heart! How powerfully will it support thee amid all the afflictions incident to life, because nothing can rob thee of this felicity! Let not the love which thou owest to thy Redeemer, be ever separated from lovely gratitude. Strive, O christian, as far as lies in thy power, to offer up to him who hath done so much for thee, the sacrifice of a pure heart and of a holy life.

What shall I give to thee for all thy love, O my supreme benefactor! It is thou that hast reconciled me with God, and hast obtained for me life and salvation. To thy service, O Lord, I devote all my faculties and all that I possess; and without ceasing I will adore thee with body, soul and spirit.

DECEMBER 26.

OF THE PLACE OF CHRIST'S NATIVITY.

IT is of itself of little importance, at what place Christ was born. Whatever may have been the circumstances of his life, we cannot but consider him as our Redeemer. But since it pleased God to announce the place in which the Saviour of the world should be born, it became necessary that it should happen precisely at the appointed place, that the accomplishment of the prediction might be a proof that Jesus Christ was the true Messiah.

It is also perfectly immaterial where we may live, if we only enjoy true happiness. Not a place in the world is so poor and so despicable, but what its inhabitants may be better and more contented than those of the largest and most celebrated cities. Can we name a single spot on the face of the globe, where the works of God are not presented in a thousand different forms, or where a person may not always experience the sweet satisfaction arising from a well spent life? For each individual that place is the best where he can experience and communicate the greatest happiness. For a whole nation that place is the best which contains the greatest number of wise and good men. On the contrary, every place declines in proportion as the influence of justice and religion is diminished. The place where a youth has experienced the most exquisite delight from the aspect of the opening morn and the renovated beauties of Nature, and adored his God with the warmest sentiments of love and veneration; the place where a pious person first beheld the object of his or her love, or where friends have given each other

the strongest proofs of their mutual attachment; the place where a man has witnessed or afforded a striking example of beneficence, justice or patience: such a place I say, cannot fail to be for ever dear to the heart.

Upon this principle Bethlehem, was not an insignificant spot, but a place of high respectability, since it had been the residence of many pious persons, and the theatre of many virtuous actions.

It was there that the patriarch Jacob remained some time to erect a monument to his beloved Rachel. It was at Bethlehem that the honest Naomi and Ruth her modest daughter-in-law evinced their faith and their virtue, and there also Boaz, their generous benefactor, had his abode and his possessions. At Bethlehem dwelt the humble and happy Jesse, the father of several sons, of whom David, the youngest, was called from the occupation of a shepherd to the throne of Israel. Here that monarch made a vow to build a temple to the Lord, and to approve himself the true shepherd and father of his subjects, when, at the sight of the angel whose sword spread pestilence and devastation, he prayed to God to have mercy on his people. At Bethlehem was born the prince Zerubabel a descendant of David, who was the type of that ruler and shepherd, around whom Israel was at a future period to assemble, and to enjoy happiness under his government. Lastly in this place appeared the son of God, who by his birth laid the foundation of that salvation which, as the Redeemer of mankind, he resolved to purchase for the whole world. Through this event, this insignificant spot has become a most interesting place for the whole human race; the most obscure village has often given birth to a man who, by his

wisdom, his integrity or heroism has proved a blessing to whole kingdoms.

It is now our duty so to live in our cities, villages, and hamlets, that the object for which Christ was born may be accomplished in us. Real piety would certainly make a more rapid progress in the world, if in every place in which we dwell, we were to endeavor to give proofs of virtue, faith, patience, industry and integrity. If our cities exhibited more numerous patterns of probity, their influence would extend to the inhabitants of the country; so that the smallest village would not be without a number of families, distinguished, like Joseph and Mary, for piety, and uprightness, and respectable even amidst the lowest indigence and the greatest obscurity. On such a place and its inhabitants the Almighty would shower his blessings, and after a few generations, we might expect that a people would arise, fearing God, and walking conformably with his commandments.

He who has traversed every region of the globe, who has visited the residences of kings, where every species of iniquity is practised, has abundant cause to be thankful to God; when he at length discovers some small town or village, where in a peaceful cot, surrounded by well-disposed neighbors, he can devote himself entirely to the service of his maker, and the benefit of his fellow-creatures, and thus ensure the enjoyment of true content and happiness. He will not regret other places more magnificent but more vicious; more extensive, but more contaminated with guilt; more opulent but more ungodly. He will prefer the obscure retreat where, free from the pangs of remorse, his days glide away in uninterrupted peace and satisfaction.

Of the care which God takes of men from their birth.

DECEMBER 27.

OF THE CARE WHICH GOD TAKES OF MEN, FROM THE PERIOD OF THEIR BIRTH.

O HOW many things did I stand in need of at the period of my birth! With pain and not without human assistance I came into the world; and it was a wonder that I was born with a sound constitution, and free from bodily infirmity. But after I was brought into the world, I should certainly have either perished immediately, or have grown up like a beast, had not food been provided to support and clothes to cover me, had there not been men to take care of me and to attend me, or rather it was thou, the general father of all creatures, who in mercy deignedst to make a provision for me.

It was thou who tookst care of me while I was yet in my mother's womb, and human art and skill, could have afforded me no assistance. Thou gavest me flesh and bones; thou knittedst my members together, and determinedst their relative proportions. Thou prescribest to the veins the course they were to take, and replenishedst them with the vital fluid. Thou createdst the skin with which this whole living fabric is covered. Thou developedst all these from a shapeless mass, which thine omnipotence had fashioned. Thou combinedst with this mortal part an intelligent and rational spirit and thus didst thou form a creature worthy of being an image of thyself. This same Providence which watched over me with such paternal care at the very commencement of my existence has never forsaken me for a single moment. It accompanied me into the world, and on my entrance into life assigned me the most tender and faithful friends, who receiv-

ed me with the utmost affection, and spared no pains to promote my well-being. These faithful friends were my parents. How miserable should I have been, hadst not thou, O my Creator, implanted in their hearts an attachment so disinterested! But even this attachment would have been of little service to me, had my parents been destitute of the means of assisting and providing for me. It would only have been a source of the greater grief and anxiety, the less they were able to supply my wants. Thou hast therefore taken care, O my God, that my parents should be furnished in due time with all the necessaries which I stood in need of ever since the period of my birth.

But thy Providence, O my father, did still more for me when I came into the world. At that early period of my existence, thou laidst the foundation of all the future events of my life. Helpless creature that I was, I neither did nor could know what was to be my destiny, but to thee my omniscient Creator every thing was perfectly known. To thy view my whole life was exposed; thou beheldst all the contingent and future events that should happen to me, together with all their consequences and relations. Thou knewest what would be the best for me, and thou determinedst my lot accordingly; at the same time contriving the means of conferring upon me every possible benefit consistent with it. Those thou hast regulated as well as my lot in general. At the very hour of my birth, the causes which were to have an influence over my happiness, already existed, and began even then to operate conformably with thy views. How great a portion of my felicity depended on the parents, who gave me life, on their way of thinking, their

condition, their fortune and connections! How powerful must have been the influence of the education which I received in my youth, of the examples given by my acquaintances and others, the opportunities which I fortunately enjoyed for exercising my faculties and displaying my talents, on the happiness of my life! And all this, O my God and Father was the work of thy wisdom and goodness. How could I chuse my parents and determine their fortune and condition before I was born? How little depended on myself or my parents and friends in the choice of teachers and companions; however great their care and prudence in this particular might have been, they could not have made an advantageous selection for me, had not circumstances contributed to that end. And by whom were these produced but by thy Providence, O my heavenly father? As thou hast watched over my happiness, so also thou hast directed with the same care every untoward event. Thou hast foreseen and weighed them all, and dispensed them for wise and salutary ends. Thou preparedst them at my birth; thou knewest even then how far affliction would be useful to me, from what causes it should proceed, and at what time their operation ought to commence in order to prove the more beneficial. All these causes were produced by thee in due season, and acted for some time in secret. At length when they were fully developed, I discovered that adversity was necessary for my true happiness. But it would not have produced such salutary effects, without the concurrence of various causes, which were long before operating remotely, though unknown to me. Such have been the dispensations of thy supreme wisdom and good-

ness, which have turned all the events of my life to my advantage.

These considerations must naturally fill my soul with confidence and tranquillity. Can any thing be more consolatory than the conviction, that I am under the care of an invisible being, infinitely bountiful, wise and powerful, who watched over me when I was still in my mother's womb; who even then determined and provided all that I should have occasion for throughout my whole life; who numbers all my days, and has appointed for them a term which no human power is able to alter; and who, at the moment of my birth, prepared all that was necessary for my temporal and eternal felicity? Can any happiness exceed that which is grounded on this conviction?

DECEMBER. 28.

PERIOD OF HUMAN LIFE.

Every person dies precisely at the time which God in his infinite wisdom has been pleased to appoint. As the period of our birth is fixed, so also is that of our death; but the term of our life is not subject to a necessary and immutable fatality; for no such thing exists. Every circumstance that occurs might happen sooner or later, or even not at all. The man who expired to day, might possibly have died earlier or lived longer. God has not numbered the days of any individual by an unalterable decree, without regard to the circumstances in which that individual may be placed. He is a wise God, who does nothing without motives worthy of supreme intelligence. He must, therefore, have had just

reasons for decreeing that a person should leave the world at one particular time rather than at another. But though the term of human life is not affected by any immutable necessity or fatality, it is not the less certain and can never be really changed.

Whenever a man dies, his death must always be occasioned by certain natural causes, whose operation, however, may be suspended by the divine power. One person is carried off by a mortal disease, another by a sudden accident; this perishes by fire, that by water. All these causes, God, in his omniscience, has foreseen, and he has not remained an indifferent spectator, but he has examined them all with care, compared them with his designs, and in his wisdom duly weighed their propriety. If he approves them, his divine will decrees that the individual shall die at a certain time by some particular accident or contingency. This decree can neither be revoked nor impeded; for the same reasons which he may now have for removing a person out of the world were known to him from all eternity, and had then just the same weight with him as they have at the present moment. What then is capable of inducing him to alter his decrees?

It may, however, happen, that God, foreseeing the causes of the death of a particular individual, has not approved of them. In this case he must at least have determined to permit them; otherwise these causes could not have existed, and the individual would not have died. If he has resolved to permit these causes of death, it is of course his will that we should die at the time when these causes exist. He may, indeed, be disposed to grant us longer life; for this also is a benefit which his good-

ness is willing to dispense to all mankind. Though he may not approve the causes of our death, still it is not consistent with the decrees of his wisdom to prevent them. He took a comprehensive view of the universe, and discovered reasons for permitting a person to die at a particular time, though the manner and circumstances of his death were not perfectly pleasing. His wisdom found means to make this death subservient to a useful purpose, or he foresaw, that, under the existing circumstances, a longer life would not be of advantage either to the person himself or to the world in general; or he perceived that his death could not be obviated without a totally different and new combination of things, which would have been inconsistent with the general plan of the world, and have prevented much greater good from taking place. In a word, though God may sometimes disapprove the causes of a person's death, he has always just reasons for permitting it, and consequently for decreeing at what time and in what manner each individual shall die.

These considerations are calculated to make us regard death with becoming fortitude and pious resignation. The principal thing that renders death so formidable is our uncertainty with respect to the time and manner of its coming. If we knew beforehand the time of its approach, and the pains with which it would be attended, we should perhaps await its arrival with greater composure, and meet it with less terror. Nothing is more capable of relieving us from this anxiety, than the belief in a Providence which watches over us, and which, before the foundation of the world, decreed the time and the manner of our death. The term of our lives is appointed by God, and none of us can die

sooner or later, than the time which the Almighty in his infinite wisdom has judged the best for us. An all-powerful Providence watches over our days, and lengthens or abridges them as it sees most conducive to their temporal and eternal welfare. In this persuasion we shall await death with tranquillity and composure. We know not the time of his coming; it behoves us therefore, as rational creatures, to be continually ready to receive him, but on this we are assured that he cannot arrive till it pleases God that we should die. It is uncertain under what form he will come; but we know that we cannot die in any other manner than what our beneficent father who governs the world, judges most advantageous for ourselves and for those who belong to us. Strengthened by this conviction, let us cheerfully pursue our terrestrial pilgrimage, patiently submitting to all the dispensations of Providence and shunning no danger to which the performance of our duty may expose us.

DECEMBER 29.

MUTABILITY OF TERRESTRIAL THINGS.

THERE is nothing in the widely extended empire of Nature but what is liable to incessant changes and variations of its essence and condition. Every thing is frail and perishable; and no object whatever possesses such durability as to remain continually the same. The most solid bodies are not so impenetrable, and so compact as to bid defiance to the power of dissolution and destruction. Every atom is incessantly appearing under a different form. How many changes has my body undergone, since

its first formation in my mother's womb! Every year it has sustained a loss of its constituent parts, and every year it has received the accession of new ones from the mineral, vegetable and animal kingdoms. Every thing upon earth is alternately increasing and decreasing only with the difference that these changes do not take place so speedily in some bodies as in others. The heavenly bodies appear the same as when they were first created, and perhaps they are the least changeable of all material objects. Attentive observers of the heavens have, nevertheless, noted the disappearance of certain stars; they have remarked spots in the sun which are subject to variation, and prove that this luminary is not always in the same state. His motion also renders him liable to manifold changes, and though he has never been extinguished, yet he is often obscured by fogs and clouds and even by eternal revolutions. So much we know notwithstanding the prodigious distance of his orb. How many changes not only of its interior structure but also of its external condition should we discover, had we an opportunity of taking a nearer survey! If the instability of terrestrial things is more apparent, the reason is because they are closer to us. And how changeable, how inconstant is their nature! Every object appears the same as it was, but in fact it is totally different. We daily observe things assuming new forms, some growing, others diminishing, and hastening to decay.

Of this the year which in two days, will terminate, affords incontestable evidence. If I confine myself to the small circle in which I move, how numerous were the changes that I have witnessed. Many of those whom I had known for years are no more;

many whom I have seen rolling in wealth, are plunged into indigence or reduced to a state of mediocrity. And when I turn my attention to myself how many changes have, during the present year, taken place in my condition! I feel that my health and spirits have declined, and am sensible of such alterations as warn me of the approach of that awful change which death will finally accomplish. And how many changes may yet occur in the two days of this year which are yet to come. I may be reduced to poverty, I may be afflicted with disease, I may experience the perfidy of those whom I accounted my friends, or I may even be removed during this interval into eternity. At least I am not certain that circumstances will not occur, which it is now impossible for me to foresee or to conceive.

Reflections like these would infallibly render me dejected or perhaps plunge me into despair, were it not for the consolation which religion affords. Religion conducts me to thee, who art the only immutable and eternal being, and whose nature is not susceptible of change or variation. Thou, O unchangeable Being, wilt always be what thou art; thy loving kindness will therefore, accompany me for ever, and thy justice will endure to all eternity. Let this truth be ever present to my mind, and soothe me under the tribulations resulting from the vicissitudes of this mortal life. Thanks be to thee that the changes of ages, years and days, bring me nearer to thee, the immutable God, and to that world in which neither changes nor revolutions shall take place. I will submit then, with resignation to all vicissitudes, and place implicit confidence in thy invariable goodness. My soul shall rejoice in thee,

O thou unchangeable Being, who art my rock, my light, my hope and my consolation.

DECEMBER 30.

RETROSPECT OF LIFE.

THE approaching termination of the year leads me to make some reflections, which do not always engage so much of my attention as they ought. In order that I may feel the more sensibly the brevity of life, I will now calculate the number of days which I have spent to a truly good and useful purpose, though I fear that the result will cover me with shame and confusion.

I first recollect those days which I had it not in my power to dispose of as I please. How many hours, during the past year, have I been obliged to spend in eating, drinking, sleeping, in attentions required by my body and in providing for its wants!. How many have I been forced to pass in occupations almost wholly unprofitable for me, that is, for my immortal soul; for instance, in necessary journies, in disagreeable companies, in long and fatiguing entertainments! How many hours have been spent in uncertainty and consequently inaction; in the investigation of abstruse questions and subjects; in the formation of important resolutions which require a mature consideration of the reasons for and against them, or in the expectation of certain promised goods! How many days have I been under the necessity of employing in preparation for certain ways of life or individual occupations, and which alone make up a great portion of the year! When I take a rapid survey of all these days

and at the same time recollect that they have been almost wholly lost for me, that is, for my immortal soul, which dwells in this perishable habitation of clay, what shall I find left, after so large a deduction for the period of real and effective life? It is evident that out of three hundred and sixty-five days scarcely fifty remain of which I can say that they are mine, and that I can employ them in assuring the important interests of my soul and in the acquisition of everlasting felicity.

Yet, how is this small remnant of my days in general diminished before I am aware by my own weakness or criminalty! How many of the past days have I devoted to sin and vice; O merciful God! how humiliating is this reflection! Nothing but the blessed doctrine of the merits of thy son, could prevent it from overwhelming me with despair. How many hours which thy paternal love allotted me to be employed in securing my eternal welfare, have I wasted with such scandalous dishonesty, with such black ingratitude, in a total alienation from thee, the best, the most tender of fathers!—wasted, in vanity, idleness, dissipation, in the indulgence of unchaste desires, of envy, jealousy, slander, and other vices of a heart destitute of love towards God and charity to man, to the molestation, confusion and injury of thy kingdom! Even since God amended my heart, and led me into the path of christian virtue, how many of my days have been spent in a total disregard of this virtue! For even those who have made the greatest progress in virtue are not wholly exempt from manifold faults, distractions, coldness and indifference of soul, doubts and perplexities, want of charity, chastity, and other virtues, the effects

of the present disorders and frailty of our body, of the weakness of our understanding, and of the power of our sinful desires strengthened by the bad habits which we formerly contracted. By all these my virtue and my happiness have not only been retarded in their growth, but more or less weakened and diminished. Besides, with what rapidity does this portion of life pass, or rather fly away! A year is gone before I am aware—and a year is a good deal to a man the hours of whose real and effective life may be so easily calculated—before I am aware a year is irrecoverably gone! I should not wish to recal this year, either in the whole or in part, if I had employed it for the salvation of my soul. But now that I see how far I have been from living in a manner conformable with my destination, I could wish the return of at least that portion of the year, which I am conscious of having misapplied. But vain is that wish. This year together with all the good and bad actions by which it is marked, is engulphed in the ocean of eternity. How then can it ever return!—Most merciful father, with whom I am reconciled by Jesus Christ, let not the past year fill me with anguish and remorse, when extended on the bed of death, neither let it appear in judgment against me in eternity! Let the numberless transgressions which I have committed be blotted out, and let this misspent year be forgiven in the hour of death, in judgment and in eternity.

DECEMBER 31.

HYMN OF PRAISE FOR THE CONCLUSION OF THE YEAR.

THOU, O Lord art the God of time and also of eternity. I will attune a joyful song to thy praise, and celebrate thy holy name. Another year is fled, and to what, O my God, but to thy grace and mercy do I owe the continuation of my life!

Receive my adoration, thou Being eternal and immutable, whose nature is incapable of change. We are born and we die, we flourish and we fade. Thou alone remainest unchangeable; thou alone wast, art and shalt be from eternity to eternity.

Thy mercy endureth for ever, and thy loving kindness is each morning renewed to shower blessings upon us. There is not a single moment of my life but what is marked by thy favors.

In the past year also thou hast conducted me with paternal tenderness; and when my heart was a prey to care and sorrow, thou preparedst for me relief and consolation. I praise thee with all my soul, O my God, and anew resign myself to the guidance of thine unerring wisdom.

Pardon the numberless sins which I have committed in the days that are passed, and continue to afford me thy paternal support. Let me live content in the enjoyment of thy grace, and teach me in all things to do what is well pleasing unto thee.

Give me new strength and a sincere desire to walk uprightly before thee; and let integrity be the principle of all my transactions with my fellow-creatures. Let thy spirit wean my affections from the world, and fix them upon thee, O thou supreme good!

The world is perishable. Let this consideration induce me to shun its pleasures, and teach my heart to aspire to nobler joys. I know that I am allied to the angels, and that heaven is my patrimony. Grant then, O Lord, that to this point my wishes may be continually tending.

O teach me thyself how to make the most profitable use of my time, and to walk with holy circumspection in the path that leads to everlasting life! Deign to alleviate the burdens inseparably attached to humanity, till with thee I shall enjoy felicity that knows no interruption!

THE END.

INDEX.

ADANSON, M. his account of the baobab, an African tree, 45; note.
Air, its properties, 242-3.
Animals, of their reproduction, 12; of marine animals, 103; of certain foreign animals, 129; remarkable circumstances relative to certain species, 204; of their clothing, 229; care with which they provide for their subsistence in winter, 235.
Ass, character of that animal, 75.
Atmosphere of the earth, observations on, 51.

Baobab, prodigious size of that tree, 45; note.
Bed, reflections on one, 109.
Bees, their instinct of economy, 236.
Birds, their instincts and properties, 9; of their migrations, 39.
Births of men, their proportion to deaths, 54.
Blacklock, his paraphrase of the 104th Psalm, 1.
Blood, its circulation, 61.
Body, human, proportion of its different parts, 64; their advantageous situation, 158.
Brockes, a German poet, brief character of his works, 210.
Butterflies, beauty of their clothing, 230.

Camel, brief account of, 130.
Cedars, antiquity of some upon Mount Lebanon, 45.
Chace, reflections on that amusement, 135.
Christ reflections on his birth, 268; on the place of his birth 272.
Clothing, gratitude for it, 226.
Cold, its gradual increase, 175.
Colibri, beauty of that bird, 231.
Contentment, motives for, 193.
Corn, reflections on, 77.
Cranes, their migrations, 41.

Dog, the, his character and uses, 205.
Dreams, thoughts on them, 159.
Ducks, wild, their migrations, 41.
Duhamel, curious experiment made by him on a chicken, 18.

Earth, different species of it, 43; its properties as an element, 245.
Earth, the, of its atmosphere, 51.
Elements, the, reflections on them, 242.
Elephant, brief description of that animal, 199.
Elk, the, observations on, 131.
Evils, apparent, often prove real benefits, 219.

Feelings, sense of, 122.
Fire, its effects, 6.
Forests, reflections on them, 138.
Fortuitous events, reflections on those which are so called, 187.

Globe, the, its accidental revolutions, 228.
God, hymn of praise to him, 1; his government with respect to natural events, 18; of his particular providence, 78; his magnificence in the works of creation, 82; his power and providence, 100; wisdom displayed by him in the connection of the different parts of nature, 160; display of his power in small things, 171; of his greatness, 190; grateful recollection of his blessings, 194.
Golberry, M. his account of a prodigious tree, 46. note.
Gum-trees, their prodigious size, 45.

Hair, human, description of it, 150.
Hare, sagacity of that animal, 206.
Heart, the, its structure and action described, 61.
Horse, his utility to man, 74.
Hymn of praise, 102, 196. 287.

Inertion, law of, 93.

Leaves of trees, their fall, 30; uses of fallen leaves, 31.
Lobsters, curious particulars, respecting them, 153.
Life, human, of the period of their birth, 278; retrospect of it, 284.

Mankind, of its origin, 197.
Marmot, particulars concerning it, 181.
Men, their wants, 94; of the care which God takes of them from the period of their birth 275.

Nature, her inexhaustible riches, 21; of the gradations in

her works, 27; destruction in her empire, 58; concurrence of all her works in the general preservation, 141; her order and regularity, 161; transformations in her works, 168; nature a school for the heart, 215.
Navigation, reflections on, 67; more dangerous in former times than at present, 71; benefits derived from it, 72.
Nerves, their use, 122.
Night, its inconveniencies, 115.

Ox, the, his utility to man, 78.

Paley, Dr. reflections on the structure of the heart, 68.
Petrifactions, observations on, 24.
Planets, of the influence ascribed to them, 252.
Plants, reflections on such as flourish in winter, 219.
Polypus, its singular properties, 16.
Presentiments, reflections on, 98.

Quails, their migrations, 40.

Rein-deer, particulars respecting that animal, 131.
Resurrection, the calculation respecting it, 274.

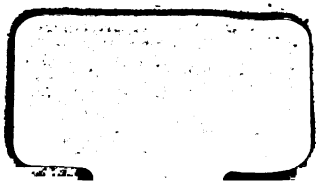
Sable, the, esteemed for its fur, 131.
Salt, its properties and uses, 145.
Seiba, a tree of Congo, account of it, 44; note.
Sheep, their utility, 205.
Ships, their ingenious construction and astonishing weight, 68.
Sleep, of certain animals in winter, 189.
Snow, reflections on it, 178; its formation and different figures, 208.
Springs, their origin, 147.
Stars, of the influence ascribed to them, 252.
Storms, their utility, 184.
Summer, reflections on its conclusion, 84; reflections on the past summer, 112; recollection of its pleasures, 126.
Sun, the centre of the universe, 153; his apparent motion, 154; his rays applied to culinary purposes, 202; note. his action upon the earth, 246.
Swallows, their migrations, 40, 41.

Taste, of the organs of that sense, 15.
Temperature, its variety in different climates, 47.
Terrestrial things, their mutability, 281.
Time, of its division, 81.
Tongue, the, description of it, 15.
Tooth, remarkable circumstance in its structure, 123; note.

Trees, variety of them, 43; prodigious size of certain species, 44; their great number and diversity, 119.

Universe, the, system of, 153.

Water, its properties, 245.
Winds, their diversity, 132.
Wine, its beneficial effects, 36; reflections on its adulteration, 37; and on its immoderate use, *ibid.*
Winter of northern regions, reflections on it, 165; exhortation to remember the indigent in that season, 212; reflections on its ravages, 252; its benefits, 238; its cold rains, 249.
Woods, reflections on them, 118.
World, the, reflections on its age, 197.
Worms, multiplied by cutting, 12.

END OF VOL. IV.

JAMES CUNDEE, PRINTER,
LONDON.